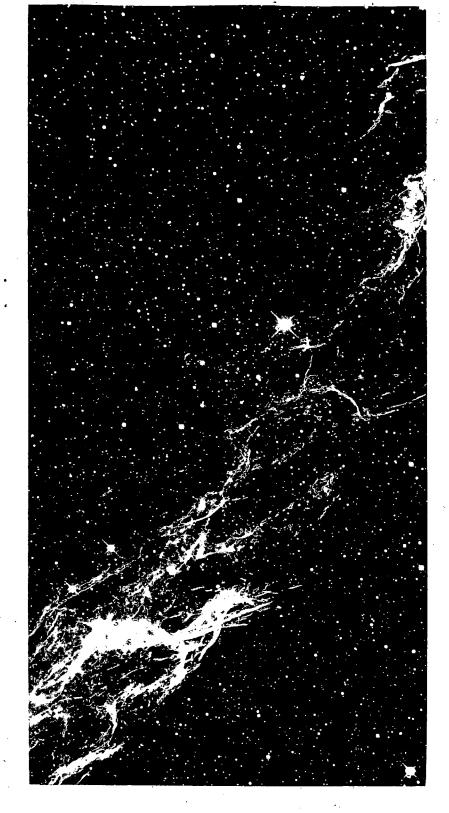


ASTRO SCIENCES

N73-12890 1



Technical Memorandum P-42

ASTEROID SELECTION FOR MISSION OPPORTUNITIES

Appendix: Asteroid Data Sheets



Technical Memorandum

P-42

ASTEROID SELECTION FOR MISSION OPPORTUNITIES

APPÉNDIX

ASTEROID

DATA

SHEETS

							1 CERES	-1.
					<u>-</u>			REFERENCE
B(a,0):	7.56			MAGNITU): 4.11	DE	wt:	4.0	
		_		COLO				
B-V •63	a 20	U-B •13	4 20		B-V		U-B	Ahmed (1954)
					0.71		0.42	Gehrels (1970)
•73 •72	ф 52	.45 .42	22 4					Gr. & K. (1954) Ge.&Ow. (1962)
Color : Curve :		SPEC'	ral Ri	EFLECTI	VITY	CURVE	R/B = 0.94	4
OUI VO	- 1.2	· · · · · · · · · · · · · · · · · · ·	PHA	ASE FAC		- 		
В		V		U	В	-V	U-B	
		0.050						Ahmed (1954)
		'	D/	OLARIZA	יידרוע		·	
$\alpha_{\mathbf{m}}$	in	Pmin		TIVITED	αx		h (%/deg)	
8-9		-1.8	4 **		17°		0.32	Veverka (1970)
Period(l	hr)	Amplit		GHT CUR	VE	Re	marks	
		Min.	Max.					
9.078		- ,	0.04					Gehrels (1970)
							•	
cliptic			cliptio	OLE Lat:		Obli	quity:	
IASS:	6.0 ±	0.7 x 10 ⁻¹⁰	0					Schubart (1971
Po	ethod olariza oermal	Diam ation IR 840-9	neter (k)20	PARAME (m)	Alb		Density	Veverka (1970) Matson (1972)
	rect f ermal			. •		, :	1.6 - 0.7	Dollfus (1971) Allen (1971)
PROPI a		BITAL ELEM	ÆNTS sin i		FAMIL Willi	Y MEMB	ERSHIP eres	
2 ,7 66	5 c	0.101	.169		Arnol	d: A-6'	7	

								2 PALLAS	
									REFERENCE
~ ()	0 (1				MAGNIT				
B(a,0):	8.64			B(1,0): 5.18		wt:	6.0	
					COL				
B-V	α		U-B	α		B-V		U-B	
						0.65		0.26	Gehrels (1970)
.67	13				,				Gr.&K. (1954)
					•				
			SPFC	rrat. R	TOT.TAG	IVITY CU	RVE	D/D 0	05
Color Curve			DI LO.	·	di dooi	17111 00	I VII	R/B = 0.	• 75
				PH	ASE FA		_		
В			V		U	B-V	•	U-B	•
						 0. 0	1		Chapman (1971)
					OLARIZ	ATION			
α_{m}	in		Pmin	ı		$\alpha_{\mathbf{x}}$		h (%/deg)	·
9-10			-1.3	3		18°		0.28	Veverka (1970)
					GHT CU	RVE			
Period(h	nr)	Am Min.	plitu				Re	marks	•
				Max.					•
9-12?		0.12		0.15					Gehrels (1970)
cliptic	Long	:	Ec	P(liptio	OLE c Lat:		Obli	quity:	
IASS:						 			
		 	рц	STCAT	PARAM	PTEDC			
M∈	thod		Dian	neter (cm)	Albed	0	Density	
		ation		·	,	0.04-0.		24-12-103	Veverka (1970)
	nermal		370-	560_		0.037-0	•13		Matson (1972)
	irect licrom		700 +	250					Dollfus (1971) Gehrels (1970)
	ccult		> 43.0)					Taylor (1962)
		BITAL				FAMILY	MEME	FDCHTD	
a		e		sin i		William	11111111 12 • 1	Dallas Dallas	
2.769 AU)	0.256	(588		Arnold:	B-2	28 .	

	·		3 JUNO	
				REFERENCE
(a,0): 9.67	MAGN B(1,0): 6	ITUDE •43 wt:	: 6.0	
B-V a 16 .85 15 .83 12 .83 21	U-B a .44 16 .43 15 .43 12 .48 21	OLOR B-V 0.81	U-B 0.39	Gr.&K. (1954) Gehrels (1970) Gr.&K. (1954) Gr.&K. (1954) Ge.&Ow. (1962)
$ \begin{array}{l} \text{Color} = \underline{MR} \\ \text{Curve} = \underline{R3B} \end{array} $	SPECTRAL REFLE Broad, deep band	0.97 µ. Possibl	14/10 - 10	57
В .	V U 0.025	B-V ~ 0.002	U-B	Gr.&K. (1954) Chapman (1971)
α _{min} 8-9°	POLAR P _{min} -0.8 %	IZATION ^Q x 19°	h (%/deg) 0•10	Veverka (1970)
	LIGHT Amplitude Min. Max.		Remarks	2.1.2 (4.272)
7.213	- 0.15		·	Gehrels (1970)
cliptic Long:	POLE 71? Ecliptic La	t: 49? Obl	liquity: 28?	Vesely (1971)
Method Polarizat Dire ct fi Thermal I	lar 195(?)	AMETERS Albedo 0.18-0.24	Density	Veverka (1970) Dollfus (1971) Allen (1971)
PROPER ORBI	ITAL ELEMENTS sin i	FAMILY MEN Williams:		
2.668 0. AU ?	22 0.246	Arnold:		

					4 VESTA	·
						REFERENCE
D(- 0) (0			MAGNIT		0.0	
B(a,0): 6.8	5	В(1,0): 4.31		: 8.0	
B-V a	•	U-B α	COL	OR B-V	U-B	
- •				0.77	0.46	Gehrels (1970)
.78 4		.45 4		,		Gr.& K. (1954)
Color = M		SPECTRAL R	EFLECT:	IVITY CURVE	R/B = 1.3	4
$Curve = \overline{M}$		Very deep bar	d 0.95	u. Stronges	t yet observed.	
			ASE FA			
В		V	U	B-V	U-B	
	C	0.0253		◆ 0.0018	+ 0.0027	Gehrels (1967)
		٠	•			
	·	P(DLARIZA	VOTTON		
$\alpha_{ t min}$		P _{min}	·	αx	h (%/deg)	
10-11 ⁰		-0.5 %		21°.5	0.08	Veverka (1970)
		, ,	•	ŕ		
Period(hr)	Λ m:	LI(plitude	GHT CUI		Remarks	
reriod (mr)	Min.	Max.		P	Cemarks .	
5.342 129	0.10	0.13			•	Gehrels (1970)
10.68	-	-				Mc.&Bu. (1972)
Ecliptic Lo	57?	P(Ecliption	OLE Late	74? Ob1	12? liquity: 32	Vesely (1971)
-	O Int	•		80? UD1	erquity: 3?	70501 3 (17/17
1ASS: 1.20	± 0.12 x					Hertz (1968)
Meth	od	PHYSICAL Diameter (ETERS	Donoito	
	rization	Diameter (CIII)	Albedo 0.23-0.32	Density	Veverka (1970)
Ther	mal IR 🕝	560-640		0.093-0.11		Matson (1972)
Dire Pola	ct rization	410(?) 515 -6 5	•	0.25 ± 0.0	7	Dollfus (1971) Veverka (1971)
Ther	mal	570 ± 10			2.5 ± 0.7	Allen (1971)
PROPER a	ORBITAL e	ELEMENTS sin i		FAMILY MEN Williams:		
2.362 AU	0.263	0.111		Arnold:		

			5 ASTRAEA	
	·			REFERENCE
3(a,0): 11.05	M B(1,0)	AGNITUDE 8.00	wt: 2.9	
5(a, 0). [1, 0)		COLOR		···
B-V α	U-B α	B-V	U-B	
		0.82	0.36	Gehrels (1970)
.82 12	•35 12			Ge.&Ow.(1962)
.85 20	.40 20			Ge.&Ow.(1962)
Color = $\frac{VR}{R1}$, R2A,	or R3A	FLECTIVITY C	URVE $R/B = 1.6$	1
В	V PHA	SE FACTORS U B-	V U-B	
D .	V	U B-	v 0-B	
 		LARIZATION		
amin	P_{\min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
		•		
		•		•
Period(hr) A	LIG	HT CURVE	Remarks	
Min	mplitude . Max.		Remarks	•
16.806 0.21	0.27			Gehrels (1970)
				,
Ecliptic Long:	PO Ecliptic		Obliquity:	
MASS:				
3611	PHYSICAL	PARAMETERS		
Method Thermal IR	Diameter (ki	m) Albe 0.046-	do Density	Matson (1972)
an in the second of the second of	4	J. 0.10-		
	•		•	
DDODED ODD				
PROPER ORBITAI	L ELEMENTS sin i	FAMILY Willia	MEMBERSHIP ms: Astraea	•
2.579 0.214			· ·	
4.07/9 V.4.4	U • UUL	Arnold	•	

		: .					
		•		 	6 HEBE		<u>.</u>
		· · · · · · · · · · · · · · · · · · ·	·			REFERE	NCE
(a,0): 9.40		MA B(1,0):	GNITUDE 6.7	wt: 3	5.5		
,(, . ,			COLOR				-
B-V α	U-B	α	B-V		U-B		
			0.82	2	0.41	Gehrel	s (1970)
	• •						
				·			
$Color = \underline{MR}$			LECTIVITY		R/B = 1.48		
Curve = R3F	3 0.95		t so deep as E FACTORS	s appears.	Possible band	d 0.67 m	<u> </u>
В	ν	LIMO		B-V	U-B		
	0.045					Ahmed	(1954)
				•			
					· · · · · · · · · · · · · · · · · · ·		
~	a		ARIZATION		h (%/deg)	,	
$^{lpha_{ exttt{min}}}$	P _m	Ĺn	$\alpha_{\mathbf{x}}$		II (%/ deg)		
•							
- 4	_	LIGH	T CURVE				
Period(hr)	Ampli: Min.	tude Max.		Rem	arks		
7.74	0.06	0.20				Taylor	(1971)
7.28	-	0.17				Yang	(1965)
						-	
		POL			• .		
Ecliptic Long	g: 145?	Ecliptic 1	Lat: 15?	Obliq	uity: 77?	Vesely	(1971)
MASS:							
	Pl	YSICAL P	ARAMETERS			····	
Method Therma	d Dia	ameter (km -280) A11	bedo]	Density	W_+	(4000)
	.1 416 210	- ∠∪ U	0.04	17-0.093	•	Matson	(1972)
		·					
PROPER O	RBITAL ELI	EMENTS	FAMI	LY MEMBE	RSHIP		
а	е	sin i		iams:			
2.426	0.155	0.249	Arno	ld:			
AU			•	•			

		_	7 IRIS	
· · · · · · · · · · · · · · · · · · ·				REFERENCE
		AGNITUDE		
s(a,0): 9.44	B(1,0)		wt: 8.0	
D 11	II D	COLOR	U-B	
B-V a	$\begin{array}{ccc} U-B & \alpha \\ .41 & 5 \end{array}$	B-V		Gr.& K. (1954)
.84 8	.53 8	0.83	0.45	Gehrels (1970) Ge.&Ow. (1962)
.86 24	• 53 8 • 48 24	·		vanHout. (1958)
.87 22	.46 22			vanHout. (1958)
.84 4	CDECMDAL DEL	TEATTOT	CYTOTYE	vanHout. (1958)
$Color = \frac{R}{R}$	SPECTRAL REI		CURVE $R/B = 1.$	70
Curve = R2A	Deep band >1.0	15 μ. SE FACTORS		
В	A ruw		3-V U-B	
_				
				•
•				
		LARIZATION	······································	
$\alpha_{ t min}$	$\mathtt{P}_{\mathtt{min}}$	$\alpha_{\mathbf{x}}$	h (%/deg)	
·			* · · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Period(hr)	Amplitude LIGH	IT CURVE	Remarks	į.
	in. Max.		ichaire,	
7.135	.04 0.29			Gehrels (1970)
				,
-11	193? Pol		59?	- ()
cliptic Long:	184? Ecliptic	Lat: 55?	Obliquity: 29?	Vesely (1971)
ASS:				
	PHYSICAL F	PARAMETERS		
Method	Diameter(kn	n) Alb	edo Density	
Thermal I	R 250 –3 00	0.038	3-0.050	Matson (1972)
				. *
				•
DDODED ÓDDE	MAI DIDAMAMA			<u></u>
a e	TAL ELEMENTS sin i	FAMIL Willi	Y MEMBERSHIP	
2.386 0.	210 0.115			•
AU		Arno1	u:	

		*				8 FLORA	
							REFERENCE
3(a,0): 9.59		B(1,0)		3	wt: 6	.0	
B-V α •88 14	U-B	α	COL	OR B-V 0.86		U-B 0.45	vanHout.(1958) Taylor (1970)
.88 11 .88 10 .88 8	.48 .49 .47	11 10 8			·		vanHout. (1958) vanHout. (1958) vanHout. (1958)
$Color = \underline{VR}$	SPEC	TRAL RE	FLECT	IVITY CU	RVE		
В	V 0.028	PHA	SE FA	B-V + 0.00		U-B + 0.004	Veverka (1970)
·		· .					·
$\alpha_{ ext{min}}$. P _{mi}		LARIZ	ATION α _x		h (%/deg)	
9 ^c	-0.	7 %	·	19°		0.12	Veverka (1970)
Period(hr)	Amplit		HT CU	RVE	Rem	arks	
13.6	0.01	0.04					Gehrels (1970)
cliptic Long		PC Coliptic	LE		Oblia	uity: 84?	7 7 (4004)
ASS:	6 1571 -	CIPCIC	nac.	10?	ODIL	uicy. 847	Vesely (1971)
Method Polariz	l Dia	YSICAL meter(k	PARAM m)	ETERS Albed 0.13-0.		Density	Veverka (1970)
				·			
PROPER OF	RBITAL ELE	MENTS sin i		FAMILY William		RSHIP	
2.202 AU	1390 [#]	.0990*		Arnold:			

^{*} Values from Arnold's listing of Asteroid data.

	•		9 METUS	·
				REFERENCE
3(a,0): 0.87		MAGNITUDE): 7.27 wt:	5•5	
,(=,0).	2(-,-,-	COLOR		
B-V 3	U-B 9	8-V 0.85	U-B 0.50	Gr.& K. (1954) Gehrels (1970) Gr.& K. (1954)
.85 5 .85 9 .84 5	.49 5 .48 9 .50 5			Gr.& K. (1954) Gr.& K. (1954) Ge.&Ow. (1962)
$Color = \underline{VR}$	SPECTRAL RI	EFLECTIVITY CURVE		
	PHZ	ASE FACTORS		
В	V	U B-V	U-B	
	+ 0.034 + 0.049	+ 0.001	0.000	Veverka (1970) Gr.&K. (1954)
	P	OLARIZATION		
$\alpha_{ ext{min}}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
90	-0.8 %	200.5	0.10	Veverka (1970)
			<u> </u>	· · · · · · · · · · · · · · · · · · ·
Period(hr)	Amplitude Min. Max.	GHT CURVE	Remarks	
5.064	0.06 .0.26	•		Geh rels (1970)
5.10	- 0.38			Yang (1965)
cliptic Long		OLE 15? Obl	liquity: 80?	Vesely (1971)
ASS:				
	PHYSICAL	PARAMETERS		
Method Polariz	l Diameter(l	(m) Albedo 0.18-0.24	Density	Veverka (1970)
PROPER OF	RBITAL ELEMENTS e sin i	FAMILY MEN Williams:	BERSHIP	
2.386 .: AU	1249* .0832*	Arnold:		

				•		•		10 HYGIEA		
									REFERENCE	
B(a,0):	10.73			MA B(1,0):	GNIT 6.5		747 t •	4.5		
B(a, ∪).	10.77			B(1,0).	COL		WL.			
B-V	α	1	U-B	α	COL	B-V		U-B		
						0.70		0.40	Gehrels (19	70)
•69	5 5		•36	5 5					Gr.& K. (19	
•68	<i>ל</i> .		•37	ر ر			•		Gr.& K. (19)	54,
Color	D		SPEC	TRAL REF	LECT	IVITY (URVE	R/B = 1.11		
Curve								R/B = 1.11 shallow band 1.0	ע 00.	
				PHAS		CTORS				
В			V		· U	В-	-V	U-B		
				POL	ARIZ	ATION				
α_{m}	nin		Pmi			$\alpha_{\mathbf{x}}$		h (%/deg)		
						Α.				
					T CU	RVE				
Period((hr)	Am _j Min.	plit	ude Max.			R	emarks		
187		rizii.		0.20					Tout on (1071	. \
ιω.		_		0.0					Taylor (1971	L)
Ecliptic	Long	::	E	POL cliptic			0Ъ1:	iquity:		
MASS:				-						
			DH.	YSICAL P	ΔΡΔΜ	TTEDC		·		
M	leth od	i	Dia	meter (km	1)	Albe	do	Density		
								-	•	
		,								
PROP	PER OR	BITAL	ELE	MENTS		FAMILY	MEM	BERSHIP		
а		е		sin i		Willia				
3.15	51	0.127	(0.09		Arnold	l:			
. A U										

						: * * *		11 PARTHEN	OPE	
·									REFERENC	E
B(a,0):	10.54			B(1,0)	AGNIT: 7.78		wt:	8.3		
					COL					
B-V	α		U-B	α		B-V		U-B		
.80	6		• 3 6	6		0.80		0.38	Gehrels (1 Wo.& K. (1	1963)
.82 .81	7 15		.42 • 3 9	? 15					Wo.& K. (1 vanHout.(1	
		**************************************	ਟਰਸਟ	TRAL RE	ET FOT	TVTTV C	יווסנודי			
Color Curve			SFEC				UKVE			
n	·		*7	PHA	SE FA		37	U-B		
В			V		U	В-	٠٧	U-B		
				PΩ	LARIZ	ATTON				·
α_{n}	nin		P _{mi}		. III I I I	αx		h (%/deg)		
		•								
Period((hr)	Am	plit		HT CU	RVE	Re	emarks	· · · · · · · · · · · · · · · · · · ·	
	` ,	Min.	L .	Max.						
10.67		0.07		0.12					Gehrels (1	970)
								,		
Ecliptic	Lon	g ·	E	PO cliptic			Obli	quity:		
AASS:		o •		·						
		· · · · · · · · · · · · · · · · · · ·	PH	YSICAL	PARAM	ETERS	*			
M	letho	d		meter (k		Albe	do	Density		
	ER O	RBITAL						ERSHIP		
a 2 hs	·	e o ogli		sin i		Willia		Parthenope		
2.45 AU).C	0.074	(0.069	,	Arnold	: A-7	6		

		<u> </u>	12 VICTOR	[A
				REFERENCE
B(a,0): 11.27	MA B(1,0):		wt: 2.2	
B-V a	U-B α	COLOR B-V	U-B	
$\begin{array}{c} \text{Color} = \frac{\text{VR}}{\text{R1}} \\ \text{Curve} = \overline{\text{R1}} \end{array}$	Possible shall	LECTIVITY CUI ow band 1.10 µ.	RVE $R/B = 1.69$ Possible band 0.6	
В	V PHAS	E FACTORS U B-V	U−B	
$^{lpha_{ exttt{min}}}$	Pol P _{min}	ARIZATION	h (%/deg)	
·· ·				
Period(hr)	LIGH Amplitude Ln. Max.	T CURVE	Remarks	
8,654	0.2			Taylor (1971) Te.&Bu.(1969)
Coliptic Long:	POL 2427 Ecliptic		Obliquity: 74?	Vesely (1971)
AASS:				
Method	PHYSICAL P Diameter(km	ARAMETERS) Albedo	Density	
PROPER ORBIT	TAL ELEMENTS sin i		MEMBERSHIP 3: Victoria	
2.333 0.1 AU	70 0.164	Arnold:	A-77	•

					13 EGERIA	
				 		REFERENCE
B(a,0): 11.01			MAGNITU): 7.97		: 1.5	
B-V α		U-B α	COLO	R B-V	U-B	
$\begin{array}{c} \text{Color} = \underline{B} \\ \text{Curve} = \underline{B2} \end{array}$		SPECTRAL R			E R/B =1.05	
В		V	ASE FAC U	B-V	U-B	·
α _{min}		P _{min}	OLARIZA'	ΓΙΟΝ ^α χ	h (%/deg)	· .
Period(hr)	Am Min.	LIO plitude Max.	GHT CUR	VE:	Remarks	
7.045		0.12	·			Gehrels (1970)
Ecliptic Long		Po Ecliption	OLE c Lat:	0b1	liquity:	
MASS:						
Method		PHYSICAL Diameter (I	PARAMET km)	ΓERS Albedo	Density	
PROPER OR	BITAL e	ELEMENTS sin i		FAMILY MEN Villiams:		
2.576 AU	0.124	0.282	A	Arnold:		

	·		14 IRENE	
·				REFERENCE
(a,0): 10.48	MAGN B(1,0): 7	ITUDE •41 w	nt: 2.0	
	C	OLOR		·
$B-V$ α	$U-B$ α	B-V	U-B	
		0.81	0.38	Gehrels (1970)
.81 10	.40 10			Gr.& K. (1954)
.82 12	•39 12			Gr.& K. (1954)
Color = MR	SPECTRAL REFLE	CTIVITY CUR	R/B = 1.50	
Curve = $\mathbb{R}3B$			0.92 µ. Possible	band 0.65 µ .
	PHASE	FACTORS		
В	V U	B-V	U-B	
	POLAR	IZATION		
$^{lpha_{ t min}}$	P_{\min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
	MLII	Α		
	LIGHT	CURVE		
Period(hr)	Amplitude in. Max.		Remarks	
11?	- 0.04			Gehrels (1970)
17.	U•V-			(1)/07
cliptic Long:	POLE Ecliptic La		bliquity:	
	- Letipete La		briquity.	
ASS:		·		
Method	PHYSICAL PARA			
Method	Diameter(km)	Albedo	Density	
PROPER ORRI	TAL ELEMENTS	TAMTT V V	EMPERCUTE	· · · · · · · · · · · · · · · · · · ·
a e	sin i	Williams	EMBERSHIP : Triplet	
2.588 0.1	94 0.151	Arnold:		
AU				

	•	* .		15 EUNOMIA	
					REFERENCE
2 (- 0)	p.(1. 0	MAGNITUDE			
3(a,0): 9.48	B(1,0		wt:	6.0	
B-V α	U-B α	COLOR B-V	7	U-B	
B-V α	U-B α				
00	1.1.	0.8	30	0.42	Gehrels (1970) Gr.& K. (1954)
.82 13 .81 6	.44 13 .41 6			•	Gr.& K. (1954)
.83 20	.45 20			•	vanHout. (1958)
83 22	.45 22				vanHout. (1958)
$Color = \underline{M}$	SPECTRAL R	EFLECTIVIT	Y CURVE		4
		ASE FACTORS			·
В	V	U	B-V	U-B	
	+ 0.042	+	0.002	+ 0.001	Gr.&K. (1954)
	· · · · · · · · · · · · · · · · · · ·	OLARIZATIO	V		
$^{lpha_{ t min}}$	P _{min}	$\alpha_{\mathbf{x}_{\parallel}}$		h (%/deg)	•
9 - 10°	-0.7 %	210		0.13	Veverka (1970)
D1 - 1 / 1 - 1		GHT CURVE		1	·
Period(hr)	Amplitude Min. Max.		R	emarks	· · · · · · · · · · · · · · · · · · ·
6.083	0.42 0.53				Gehrels (1970)
					, , , ,
cliptic Long:		OLE c Lat: 74?	Ob 1	iquity: 11?	Vesely (1971)
ASS:	2)0·				vesery (1971)
	DITTOTOAT	21222			·
Method	PHYSICAL Diameter (PARAMETERS	S Lbedo	Density	
Polariza	ti.on `		2-0.17	Dellotey	Veverka (1970)
Thermal	IR 122-280		73-0.38		Matson (1972)
	•				
					
	ITAL ELEMENTS			BERSHIP	
a e		Will	liams:	•	
2.542 .09	45 * .2211 *	Arno	old:		
AU					

								16 PS	CHE	
								·		REFERENCE
	,				GNITU					
3(a,0):	10.5	4		B(1,0):			wt:	6.1		
B-V	α		U-B	α	COLO	B-V 0.70		U-B 0.24		Gehrels (1970)
•71 •71	10 12		.26 .24	10 12						vanHout. (1958) vanHout. (1958)
Color Curve			SPEC	TRAL REF			CURVE	R/B =	1.22	
В	-		V	PHAS	E FAC U		-V	U-B		
						. •				
		*								
$\alpha_{\rm r}$	nin		P _{mi}	-	ARIZA	TION α _x		h (%/de	g)	
						·				
Period	(hr)	Am Min.	plit		T CUR	VE:	Re	emarks		
4.303				0.11						Gehrels (1970)
cliptic	. Lon	g:	E	POL cliptic 1			Obli		<u> </u>	
ASS:				,		,				
N	letho	d	PH Dia	YSICAL Pameter (km	ARAME)	TERS Albe	edo	Density		
PROF a	PER O	RBITAL e		MENTS sin i		FAMILY Willia		BERSHIP		
2.92 AU	23	0.099	(0.045		Arno1c		.3		

	,				17 THETIS	
						REFERENCE
R(a 0)			NITUDE	T.7+ - 1:	. 0	-
B(a,0): 11.49		B(1,0): 8		wt: 4	····	
B-V α	U-B	α	COLOR B-V 0.84		U-B 0.42	Gr.& K. (1954) Gehrels (1970)
.82 9 .86 16 .86 3 .82 4	.41 .46 .40 .39	9 16 . 3 . 4			0.42	Gr. & K. (1954) Gr. & K. (1954) vanHout. (1958) vanHout. (1958)
$\begin{array}{c} \text{Color} = \underline{R} \\ \text{Curve} = \overline{R4} \end{array}$		TRAL REFLI	Possible		R/B = 1.5½ 98 µ.	ł
В	V	τ	FACTORS J B	-v	U-B	G. A.K. (2.0°).)
	+ 0.04	0				Gr.&K. (1954)
		POLAT	RIZATION	1		
$\alpha_{ ext{min}}$	P_{mi}		$\alpha_{\mathbf{x}}$		h (%/deg)	
•						
Period(hr)	Amplit		CURVE	Ren	narks	
12.275	0.12	0.36				Gehrels (1970)
		POLE				
Ecliptic Long	: E	cliptic La	At:	Obliq	uity:	
MASS:						
Method		YSICAL PAF meter(km)	RAMETERS Albe	edo	Density	
·						
	BITAL ELE	MENTS sin i	FAMILY Willia	MEMBE	CRSHIP	
2.469 AU	0.142	.085	Arnolo	1: B-25		

				18 MELPOME	NE
					REFERENCE
3(a,0): 10.16	В(MAGNIT 1,0): 7.7		t: 6.1	
D **		COL		TT D	
B-V α	U-B α		B-V	U-B	
.86 28	.50 28	२	0.81	0.35	Gehrels (1970) Ge.&Ow. (1962)
.86 28	·44; 28				Ge.&Ow. (1962)
	•				
Colon - MP	SPECTRA	L REFLECT	IVITY CUR	VE	
$Color = \underline{MR}$					
		PHASE FA			
В	V	. U	B-V	U-B	
					÷
	· · · · · · · · · · · · · · · · · · ·	POLARIZ	ATION		
$\alpha_{ t min}$	$\mathtt{P}_{\mathtt{min}}$		$\alpha_{\mathbf{x}}$	h (%/deg)	
	T	LIGHT CU	RVE		·
Period(hr)	Amplitude Min. M			Remarks	
14		ax. 0.35			Gehrels (1970)
t. ,	,	·• <i>D.)</i>			Gentrers (1970)
-1:	p - 1 :	POLE		1.12	
cliptic Long	ECII	ptic Lat:	0	bliquity:	
ASS:			•		
Math. 1	PHYSI	CAL PARAM	ETERS	·	
Method	Diamet	er (km)	Albedo	Density	
•					
DD ABED	D.T				
	BITAL ELEMEN e sin		FAMILY M Williams	EMBERSHIP	
	837* .174		Arnold:	•	
AU		r-×	ALHUIU:		•

			19 FORTUNA	
				REFERENCE
3(a,0): 11.08	MA B(1,0):	GNITUDE 8,35	wt: 3.3	
Β-V α	U-B α	COLOR B-V	U-B	
		<u>.</u>		
$Color = \underline{R}$	SPECTRAL REF	LECTIVITY CU	RVE	
В .	PHAS V	E FACTORS U B-V	U-B	
$\alpha_{ ext{min}}$	POL ^P min	ARIZATION $\alpha_{\mathbf{x}}$	h (%/deg)	
Period(hr) Mi	LIGH Amplitude In. Max.	T CURVE	Remarks	
7.46 7.43 0.	- 0.25 21 0.25			Taylor (1971) Yang (1965)
cliptic Long:	POL Ecliptic		Obliquity:	
ASS:				
Method Thermal IR	PHYSICAL P Diameter (km 250-300	ARAMETERS) Albed 0.010-	o Density 0.013	Matson (1972)
PROPER ORBIT a e	sin i	FAMILY William	MEMBERSHIP s:	and a few districtions are also a few districtions and the control of the control
2.442 .1 32 0 AU	.0384*	Arnold:	A- 82	

								20 MASSALIA		
						·			REFEREN	ICE
B(a,0):	10.13			M/B(1,0)	AGNIT		wt:	2.0		
77 77	-		71 10		COL			U-B		
B-V	α		U-B	α		B-V			Gehrels	(4.020.)
.84	27		.48	27		0.81	٠.	0.43	Ge.&Ow.	
Color	= <u>MR</u>		SPEC	TRAL REI	FLECT	IVITY C	URVE			
				PHAS		CTORS		47. 70		
В			V		U	В-	V	U-B		(20 <u>7</u> ()
		+	0.032	2					Gehrels	(1956)
				P01	LARIZ	ATION				
α_{mi}	Ĺn		Pmin	n		$\alpha_{\mathbf{x}}$		h (%/deg)		
_ရ ဝ			-0.7	, Z		19 ⁰		0.10	Veverka	(1970)
Period(h	nr)	Amı	plit	LIGI	IT CU	RVE	R e	emarks		·
	,	Min.	,	Max.			200			
8,0980		0.17		0.24					Gehrels	(1970)
71-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		 		POI	.F.					
Ecliptic	Long	: 10?	E	cliptic	Lat:	78?	Obli	lquity: 12?	Vesely ((1971)
MASS:		•								
P	ethod olariz			YSICAL Eneter (kn		ETERS Albe 0.18-0	24	Density	Veverka Matson	(1970) (1972)
		BITAL						PENCITE		~~/~/
a		e priwr		sin i		Willia		BERSHIP		
2.40 AU	9 •:	1613*		.0240*		Arnold	:		•	

			21 LUTETIA	
·				REFERENCE
B(a,0): 11.40	MAGN B(1,0):	IITUDE 3.68 wt	: 2.3	
B-V α	U-B α	OLOR B-V	U-B	·
Color = B Curve = B4	SPECTRAL REFLE		E R/B = 0.99	
В	V U	FACTORS B-V	U-B	
	DOL AT	77 A TI T ON T		· .
$\alpha_{ t min}$	P _{min}	IZATION	h (%/deg)	
Period(hr)	LIGHT Amplitude in. Max.		Remarks	
6•13 3	- 0.15			Gehrels (1970)
Ccliptic Long:	POLE Ecliptic La	t: Ob	liquity:	
MASS:			·	
Method	PHYSICAL PAR Diameter (km)	AMETERS Albedo	Density	
a e	TAL ELEMENTS sin i	FAMILY ME Williams:		
2.435 0.1 AU	28 0.036	Arnold: A	1- 82	

			22 KALLIOF	E	
				REFERE	NCE
B(a,0): 11.20	MAG B(1,0):	NITUDE 7.48 wt	: 4.1		
		COLOR			
B-V α	U-B α	B-V	U-B	.	()
•71 7	.28 7	0.71	0.28	Gehrels Ge.&Ow.	
Color = B	SPECTRAL REFL	ECTIVITY CURV	E		
50101				<u> </u>	
В		FACTORS U B-V	U-B		
	DOLA	DTZATION		-	
$\alpha_{ ext{min}}$	P _{min}	RIZATION $\alpha_{_{ m X}}$	h (%/deg)		
Period(hr)	LIGHT	CURVE	Remarks		
rerrod (III)	Amplitude Min. Max.		Kemarks		
4.147	0.14 0.30			Taylor	(1971)
Ecliptic Long:	POLE Ecliptic La	at: Ob	liquity:	·	
MASS:					
Method	PHYSICAL PAI Diameter(km)	RAMETERS Albedo	Density		
					· ·
a e	ITAL ELEMENTS sin i	FAMILY ME Williams:	MBERSHIP		
2.909 .08l AU	.2200 [*]	Arnold:			·

IIT RESEARCH INSTITUTE

B(a,0): 11.49 B(1,0): 8.34 COLOR B-V α U-B α B-V 0.89 Color = \underline{VR} SPECTRAL REFLECTIVITY	wt: 3.9 U-B -	REFERENCE Gehrels (1970
B(a,0): 11.49 B-V α U-B α COLOR 0.89	U-B -	Gehre ls (1970
B-V α U-B α B-V 0.89	<u>-</u>	Gehrels (1970
0.89	<u>-</u>	Gehrels (1970
	CURVE	Gehrels (1970
Color = VR SPECTRAL REFLECTIVITY (CURVE	
Color = VR SPECTRAL REFLECTIVITY (CURVE	
Color = VR SPECTRAL REFLECTIVITY (CURVE	
$Color = \underline{VR}$ SPECTRAL REFLECTIVITY (CURVE	
B V U B-	-V U-B	
•		
		•
POLARIZATION		
α_{\min} P_{\min} α_{x}	h (%/deg)	
••••••••••••••••••••••••••••••••••••••		
		•
		·
LIGHT CURVE Period(hr) Amplitude	Remarks	
Min. Max.	Remarks	
6.15 - 0.19		Taylor (1971)
12.308 - 0.21		Yang (1965)
POLE		
Ecliptic Long: Ecliptic Lat:	Obliquity:	
MASS:		
PHYSICAL PARAMETERS		
Method Diameter (km) Albe	edo Density	
		•
		•
PROPER ORBITAL ELEMENTS FAMILY	7 . ACD CO	
a e sin i Willia	MEMBERSHIP	•
2.625 .2582* .1609* Arnold	-	

		· .	24 T H	EMIS
		•		REFERENCE
B(a,0): 12.31	B(1,0)	AGNITUDE : 8.18	wt: 2.8	
B-V α	U-B α	COLOR B-V	U-B	
	SPECTRAL RE		CURVE	
В	V PHA	SE FACTORS U F	3-V U-B	
^Q min	Po P _{min}	LARIZATION $\alpha_{\mathbf{x}}$	h (%/ de	g)
Period(hr) An	mplitude	HT CURVE	Remarks	
8.5	0.14		· .	Taylor (1971)
Ecliptic Long:	POI Ecliptic	E Lat:	Obliquity:	
MASS:				
Method	PHYSICAL I Diameter (kr	PARAMETERS n) Alb	edo Density	
PROPER ORBITAI		FAMIL	Y MEMBERSHIP	
a e 3.138 .1572* AU	sin i •0190*	Willi Arnol		

			·	25 PHOCAEA	
					REFERENCE
3(a,0): 11.70	. E	MAGNI 3(1,0): 9.		wt: 4.0	
B-V α	U-B	a CC	LOR B-V	U-B	
•99 11 •92 11	. 52	11	0.92	0 . 51	Gehrels (1970) vanHout.(1958) vanHout.(1958)
Color = VR	SPECTR	AL REFLEC	TIVITY CU	RVE	· · · · · · · · · · · · · · · · · · ·
В	V	PHASE F U	ACTORS B-V	U-B	
α	P .	POLARI	ZATION	h (%/deg)	
$\alpha_{ ext{min}}$	P _{min}		α _x	11 (%) 40%)	
Period(hr)	Amplitud	LIGHT C e Max.	URVE	Remarks	e en
9.945?	-	0.18			Gehrels (1970)
cliptic Long:	Ecl	POLE iptic Lat	:	Obliquity:	
ASS:					
Method	PHYS Diame	ICAL PARA ter(km)	METERS Albed	o Density	
		: :			
PROPER ORB	si	n i	FAMILY William	MEMBERSHIP as:	
2.401 .23 AU	.3	776*	Arnold:	5	

		· ·	27 EUTERPE	· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·				REFERENCE
2(2,0), ,, ,,	MAGNIT B(1,0): 8.5		2.2	
B(a,0): 11.06			L.L	
B-V α U	-B α	OR B-V	U-B	
D-V a 0	-B u	D- v	ОВ	
Calan - DW S	PECTRAL REFLECT	IVITY CURVE		·
$Color = \underline{BM} \qquad \qquad S$				
· · · · · · · · · · · · · · · · · · ·	PHASE FA			
В	v u	B-V	U-B	
	•			
	POLARIZ	ΔΤΤΟΝ		· - · · · · · · · · · · · · · · · · · ·
$\alpha_{ exttt{min}}$	P _{min}	α _X	h (%/deg)	
штп	mln	-x		
•	•			
Period(hr) Amp	LIGHT CU	RVE	marks	
Min.	litude Max.	Ke	marks	
8.500 -	0.15			Gehrels (1970)
	•			
7 - 1 : - 4 : - T	POLE	A1 1 •		
Ccliptic Long:	Ecliptic Lat:	, UD11	quity:	
MASS:				
·	PHYSICAL PARAM	ETERS		
Method Thermal IR	Diameter (km) 70-164	Albedo 0.026-0.14	Density	Matson (1972)
TIO HAL IN	\O=T 0\\	0.020=0.[4		racson (1972)
·				
PROPER ORBITAL	ELEMENTS	FAMILY MEMB	ERSHIP	**************************************
a e	sin i	Williams:		•
2.347 .1855*	·0146*	Arnold:		
AU		•		•

•	•			28 BELLONA	
					REFERENCE
7(-0)		AGNITUDE	4.		
B(a,0): 11.62	B(1,0)		wt: 3	•5	
B-V α	U-B α	COLOR B-V		U-B	
•					
	SPECTRAL RE	FLECTIVITY	CURVE		
В	PHA V	SE FACTORS U B	3-V	U-B	
	•		•		
		LARIZATION			
$\alpha_{ exttt{min}}$	$P_{ exttt{min}}$	$\alpha_{\mathbf{x}}$		h (%/deg)	
•		·			
Period(hr)	LIG Amplitude Min. Max.	HT CURVE	Rem	arks	
15•7 16•52	- 0.22 - 0.23				Taylor (1971) Mc.&Bu.(1972)
Ecliptic Long	PO Ecliptic	LE Lat:	Obliq	uity:	
MASS:					
Method	PHYSICAL Diameter(k	PARAMETERS m) Alb	edo	Density	
				· • • • •	
	BITAL ELEMENTS sin i	FAMIL Willi	Y MEMBE	RSHIP	
2.775 .1 AU	.1512*		d: A- 66		

			29 AMPHITR	ITE
				REFERENCE
2(2,0) + 40,05	MA B(1,0):	AGNITUDE 7.26 w	t: 4.4	
3(a,0): 10.25	D(1,0);		L: 4.4	· · · · · · · · · · · · · · · · · · ·
B-V α	U-B α	COLOR B-V	U-B	
		0.87	· •	Gehrels (1970)
•		,	•	
	annama i ann			
$Color = \frac{R}{R^{2G}}$		FLECTIVITY CUR	$\mathbf{R}/\mathbf{D} = \mathbf{L} \bullet \neg \mathbf{I}$	
Curve = R3C		SE FACTORS	Possible band 0.65	л.
В	V _.	U B-V	U-B	
	POT	ARIZATION		
$\alpha_{ t min}$	P _{min}	α _x	h (%/deg)	
штп	штп	X	, ,,	
	1.701	III. GUIDVII		
Period(hr)	Amplitude	IT CURVE	Remarks	
N	Max.		7.5 7.4	·
5.389	- 0.13		ÿ ·	Gehrels (1970)
	POL	.E		
cliptic Long:	Ecliptic	Lat: Ol	oliquity:	
ASS:				
	PHYSICAL P	ARAMETERS		
Method	Diameter (km	Albedo	Density	
and the second s	TAL ELEMENTS		EMBERSHIP	· .
a e	sin i	Williams	: Amphitrite	,
2.554 O. AU	065 0.110	Arnold:	•	,
Αυ			•	

			30 URANIA	
				REFERENCE
B(a,0): 11.32	MA(B(1,0):	GNITUDE 8.78 wt	: 4.8	
	7. 5.	COLOR		
B-V α	$U-B$ α	B-V	U-B	
04 0	.47 8	0.88	0.45	Gehrels (1970)
.91 8 .86 4	.47 8 .43 4			Ge.&Ow. (1962) Ge.&Ow. (1962)
$Color = \underline{VR}$	SPECTRAL REF	LECTIVITY CURV	7E	
		E FACTORS		
В	V	U B-V	U-B	
		ARIZATION		
$\alpha_{ ext{min}}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
	·			
			e.	
Period(hr)	LIGH Amplitude	r curve	Remarks	
	Min. Max.		Remarks	
13. 668	- 0.14			Gehrels (1970)
· · · · · · · · · · · · · · · · · · ·	POLI	7		
Ecliptic Long:	Ecliptic I		liquity:	
MASS:				
Method	PHYSICAL PA	RAMETERS		
rechou	Diameter (km)) Albedo	Density	
	•			
PROPER ORB	ITAL ELEMENTS	FAMILY ME	MBERSHIP	
a e	sin i	Williams:		
2.365 .10 AU	035* •0476*	Arnold:		
	•			

				32 POMONA	
·					REFERENCE
3(a,0): 11.81	B(1,0)	AGNITUDE : 8.74	wt:	2.9	
B-V α	U-B α	COLOR B-V		U-B	
			·	·	·
Color = R	SPECTRAL RE	FLECTIVITY	CURVE		
В	PHA V	SE FACTORS U	B-V	U-B	
·					
α _{min}	P _{min}	LARIZATION ^{$lpha_{ m x}$}		h (%/deg)	
Period(hr) Mi	Amplitude	HT CURVE	Re	emarks	
cliptic Long:	PO Ecliptic		Obli	iquity:	
ASS: Method	PHYSICAL Diameter(k	PARAMETERS m) A1	bedo	Density	
PROPER ORBITA	sin i		LY MEMI	BERSHIP	
2.588 .1136 AU	* •1087*	Arno	ld:		

			34 CIRCE	· · · · · · · · · · · · · · · · · · ·
	. ·			REFERENCE
B(a,0): 12.86	М В(1,0)	AGNITUDE : 9•58	wt: 4.4	·
B-V α	U-B α	COLOR B-V	U-B	
Color = B	SPECTRAL RE	FLECTIVITY	CURVE	
	PHA	SE FACTORS		
· B	V		3-V U-B	·
				·
α _{min}	Po P _{min}	LARIZATION α _x	h (%/deg)	
Period(hr)	Amplitude	HT CURVE	Remarks	
Ecliptic Long:	PO Ecliptic	LE Lat:	Obliquity:	
MASS:				
Method	PHYSICAL 1 Diameter (kı	PARAMETERS n) Alb	edo Density	
				· ·
PROPER ORBITA	sin i	FAMIL Willi	Y MEMBERSHIP ams:	
2.687 .14 2 1 AU	* •0976 [*]	Arnol	d:	

		·	37 FIDES	
				REFERENCE
		NITUDE		
3(a,0): 11.68	B(1,0): 8	3.49 wt	t: 6.6	
		COLOR		
B-V α	$U-B$ α	B-V	U-B	
		0.89	· -	Gehrels (1970)
$Color = \underline{VR}$	SPECTRAL REFLE	ECTIVITY CURV	JE .	
		<u>.</u>	·	
	•	FACTORS	מ זו	
В	V t	J B-V	U-B	
			1	
	DOT AT	RIZATION		
α. •			h (%/deg)	
$\alpha_{ ext{min}}$	$P_{ exttt{min}}$	$\alpha_{\mathbf{x}}$	11 (/// 408)	
•				
D = 1 (1)	LIGHT	CURVE		
Period(hr)	Amplitude in. Max.		Remarks	
**				
	POLE			· · · · · · · · · · · · · · · · · · ·
Ecliptic Long:	Ecliptic La	it: Ob	oliquity:	
MASS:			4. 1	
Method	PHYSICAL PAR Diameter(km)	AMETERS Albedo	Density	
	Diameter (Kiii)	Arbedo	Delisity	
				·
		•		
	TAL ELEMENTS	FAMILY ME		
a e	sin i	FAMILY MI Williams:		
	sin i		:	

			38 LEDA	
		•		REFERENCE
B(a,0): 13.07	MAG1 B(1,0):	NITUDE 9.68 wt	: 4,4	
		COLOR		
B-V α	U-B α	B-V	U-B	
	SPECTRAL REFL	₹₹₹₹ ₹₹₹₽	F	
Color = M	SIECIKAL KEFLI	SCIIVIII CORV	L	
	PHASE	FACTORS		
В		J B-V	U-B	
	•			
		RIZATION	h (% / do a)	
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
			·	
	•			
	LIGHT	CURVE		
Period(hr)	Amplitude n. Max.		Remarks	•
		•		
	POLE			
Ecliptic Long:	Ecliptic La	at: Ob	liquity:	
MASS:				
	PHYSICAL PAR	RAMETERS		
Method	Diameter(km)	Albedo	Density	
•			•	
				•
PROPER ORBIT	AL ELEMENTS	FAMILY ME	MBERSHIP	
a e	sin i	Williams:		
2.740 .1626	* .1392*	Arnold: A	- 66	

			39 LAETITI	Α
				REFERENCE
- / - 0\		MAGNITUDE		
3(a,0): 10.86	B(1,0)		wt: 12.6	
B-V α	U-B α .52 11	COLOR B-V	U-B 7 0.49	Gr.& K.(1954) Taylor (1971)
.88 7 .88 16 .91 20	.49 7 .66 16 .55 20			Gr.& K.(1954) Ge.&Ow.(1962) vanHout.(1958
.91 22	.47 22 SPECTRAL RE	<u>'₽1 ₽СЧТ\Т</u> ТФ	CURVE $R/B = 1$.	vanHout. (1958)
$ \begin{array}{ll} \text{Color} &= \underline{\text{VR}} \\ \text{Curve} &= \underline{\text{R2A}} \end{array} $	Broad band 1.		ble band 0.64μ .	C4
		SE FACTORS		
В	V	U	B-V U-B	
		LARIZATION		
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
	T TO	HT CURVE		
Period(hr)	Amplitude Ln. Max.	MII CURVE	Remarks	
5.138 243 0. 5.133 0.	18 0. <i>5</i> 4 18 0.29		•	Taylor (1971) Yang (1965)
cliptic Long:	130? PO 103? Ecliptic	LE 10? Lat: 61?	Obliquity: 75? 21?	Vesely (1971)
ASS:				
<u> </u>	PHYSTCAT	PARAMETERS		
Method Thermal IR	Diameter(k	.m) A11	pedo Density 2-0.19	Matson (1972)
Y.				
PROPER ORBIT	TAL ELEMENTS sin i	FAMI	LY MEMBERSHIP	-
2.769 0.0 AU	84 0.172	Arno		

		. ,		40 HARMONI	[A
		\mathcal{J}			REFERENCE
B(a,0): 10.74	;	MAGNIT B(1,0): 8.4		vt: 2.4	
B-V α	U-B	COL	OR B-V	U-B	
.88 22 .81 14 .84 7	•43 •46 •44	22 14 7	0.83	0.42	Gehrels (1970) Gr.& K. (1954) Ge.&Ow. (1962) Ge.&Ow. (1962)
$\begin{array}{c} \text{Color} = \underline{R} \\ \text{Curve} = \overline{R} 3 A \end{array}$		RAL REFLECT	μ.	RVE R/B = 1.6	4
В	V	PHASE FA	CTORS B-V	U-B	
D	V	U	. D-v	U-D	•
					•
		POLARIZ			
α _{min}	P _{min}		$\alpha_{\mathbf{x}}$	h (%/deg)	
·		LIGHT CU	RVE:		
Period(hr)	Amplitu Min.			Remarks	
9-1358	-	0.22			Gehrels (1970)
	· .				
Coliptic Long:	Ec	POLE liptic Lat:	(Obliquity:	
MASS:				· \	
Method		SICAL PARAM eter(km)	ETERS Albedo	Density	

PROPER	ORBITAL	ELEMENTS	FAMILY MEMBERSHIP Williams:
a	e	sin i	
2.267.	0.02	0.066	Arnold:

42 ISIS REFERENCE MAGNITUDE B(1,0): 8.84B(a,0): 11.57wt: 2.7 COLOR B-V U-B B-V U-B α α SPECTRAL REFLECTIVITY CURVE Color = R PHASE FACTORS V B-V U-B В U POLARIZATION \mathbf{P}_{\min} h (%/deg) α_{min} $\alpha_{\mathbf{x}}$ LIGHT CURVE Period(hr) Amplitude Remarks Min. Max. 0.26 Taylor (1971) POLE Ecliptic Long: Ecliptic Lat: Obliquity: MASS: PHYSICAL PARAMETERS Method Diameter (km) Albedo Density PROPER ORBITAL ELEMENTS FAMILY MEMBERSHIP а sin i Williams: .1327* 2.441 .1921* Arnold: A - 81AU

	• • • • • • • • • • • • • • • • • • •				43 ARIADNE	
	<u>-</u>					REFERENCE
n (a 0) ==			NITUDE		2.4	
B(a,0): 11.30		B(1,0):		WC:	2.1	·
D 11	77 D		COLOR	7	II D	
B-V a	U-B	α	B-7	<i>!</i>	U-B	
					•	
. :			,			
C 2 177	SPE	CTRAL REFI	ECTIVITY	CURVE	R/B = 1.95	
$\begin{array}{c} \text{Color} = \underline{\text{VR}} \\ \text{Curve} = \overline{\text{R1}} \end{array}$		able band 1		. 001112	R/D = 1.95	
<u> </u>			FACTORS	3		
В	V		U	B-V	U-B	
٠.						
	**************************************			<u> </u>		
· —	TD.		RIZATION	1	h (% / doa)	
$\alpha_{ t min}$	$\mathbf{P}_{\mathbf{m}}$	Ĺn	$\alpha^{\mathbf{x}}$	*	h (%/deg)	
			CURVE			
Period(hr)	Ampli			R	emarks	
	Min.	Max.				
5•7 5	-	0.13				Taylor (1971)
	.7. 7	POLE		·		
Ecliptic Long	g:]	Ecliptic I		оь1:	iquity:	
MASS:						
. # 100 .		WOTOAT T	DA1/07====		· · · · · · · · · · · · · · · · · · ·	
Method	Pi I Dia	HYSICAL PA ameter(km)		bedo	Density	
			43.2	bedo	Deligity	
77.67						
PROPER OF	RBITAL ELI e	EMENTS sin i			BERSHIP	
	•			liams:		
2.203 AU	0.135	0.07	Arno	old: 7	· · · · · · · · · · · · · · · · · · ·	
AU .						

·			1	4 NYSA	
					REFERENCE
3(a,0): 10.71		MAGNITUDE): 8.02	wt: 3.	9	
		COLOR			
B-V α	$U-B$ α	В-		U-B	
	24 22	0.6	57	0.22	Gehrels (1970)
.70 22 .59 23	.24 22 .24 23				Gr.& K. (1954) Gr.& K. (1954)
70 7	.27 7				Ge.&Cw. (1962)
	СРЕСТРАТ Р	EFLECTIVIT	V CIIDVE		
Color = BM	SPECIMAL N	EF PECT IA II	1 CURVE		
		ASE FACTOR			
В	V	U	B-V	U-B	
·					•
•					
		OLARIZATIO		· · · · · · · · · · · · · · · · · · ·	
$\alpha_{ t min}$	P_{\min}	$\alpha_{\mathbf{x}}$		h (%/deg)	•
		·		•	
		GHT CURVE		 	
Period(hr)	Amplitude in. Max.		Rema	rks	
	22 0.48				Gebrels (1970)
	40 0.51				Yang (1965)
	5. <i>1. 1.</i>				talig (1907)
-11-41 T		OLE 84?	01.11	4?	
cliptic Long:	105? Eclipti	c Lat: 30?	Obliqu	1ty: 58?	Vesely (1971)
ASS:			•		
Method	PHYSICAL	PARAMETER			
Thermal IF	Diameter (106-190		lbedo Do 041-0.11	ensity	Matson (1972)
					· · ·
		•			
PROPER ORBI	TAL ELEMENTS	FAM	ILY MEMBER	SHTP	
a e	sin i		liams:		
2.422 .171	8* .0549*	Arn	old: A-74		
AU					

				45 EUGENIA	
					REFERENCE
3(a,0): 11.87		MAGNITUDE): 8.52	wt:	3.5	
7(4,0). [1.07	D(1,0	COLOR	····	<i>J</i> • <i>J</i>	
B-V α	U-B α	B-	V	U-B	
Color = BM	SPECTRAL R	EFLECTIVIT	Y CURVE		
В	V PH	ASE FACTOR U	B-V	U-B	
· ·					
		OLARIZATIO	N		
$\alpha_{ ext{min}}$	$P_{ ext{min}}$	$\alpha_{\mathbf{x}}$		h (%/deg)	
Period(hr)	LI Amplitude	GHT CURVE	D	emarks	
lerron (mr)	Min. Max.		K	emarks	
	- 0.5				Taylor (1971)
cliptic Long:	P Eclipti	OLE c Lat:	Ob1	iquity:	
ASS:					<u>.</u>
Method	PHYSICAL Diameter (PARAMETER km) A	S lbedo	Density	
•					
a e	ITAL ELEMENTS sin i		ILY MEM liams:	BERSHIP	7
2.721 .11 AU	23* .1049*		old:		

	,	·	51 NEMAUS	Α
·				REFERENCE
· (- 0)		MAGNITUDE		·
3(a,0): 11.21	B(1,U)): 8,66	wt: 5.6	
		COLOR	77	
B-V a	$U-B$ α	B-V	U-B	
		0.81	· · · · · · •	Gehrels (1970)
Color = M	SPECTRAL RI	EFLECTIVITY	CURVE $R/M = 1.2$	9
Curve = M2	Probable broa	id band 1.02 µ		,
		ASE FACTORS		
В	V	U F	3-V U-B	
•	•			
		DLARIZATION		
$\alpha_{ t min}$	P_{\min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
		1		
			•	
•		•		
		HT CURVE	_	
Period(hr)	Amplitude		Remarks	•
	ln. Max.	•		, ,
7.785	- 0.14			Gehrels (1970)

Ccliptic Long:	P(Ecliption)LE	Obliquitur	•
criptic Long:	ECTIPETO	Lat.	Obliquity:	
ASS:				
	PHYSTCAT	PARAMETERS		
Method	Diameter (k		edo Density	
			J	
PROPER ORBIT		FAMIL	Y MEMBERSHIP	
a e	sin i	. Willi		
2.366 0.11	16 0.177	Arnol	d:	
AU				

•	,	·	52 EUROPA	
·				REFERENCE
2(2,0), 14, (2	MA(GNITUDE		
3(a,0): 11.69	B(1,0):		: 6.0	
B-V α	U-B α	COLOR B-V	U-B	
<i>5</i>	0 2 a	0.69	-	Gehrels (1970)
		0.09	_	delli e13 (1)/0/
•			·	
Color = BM	SPECTRAL REF	LECTIVITY CURV	E	
В	V PHAS.	E FACTORS U B-V	U-B	
_	•			
~		ARIZATION	h (%/deg)	
$\alpha_{ ext{min}}$	P _{min}	$\alpha_{\mathbf{x}}$	n (%/ deg)	
•				,
	?			
Period(hr)	LIGH	r curve	Damarelaa	
	Amplitude in. Max.		Remarks	
÷				
				·
cliptic Long:	POLI Ecliptic I		liquity:	
			-1	
ASS:		· · · · · · · · · · · · · · · · · · ·		
Method	PHYSICAL PA Diameter(km	ARAMETERS Albedo	Density	
	<u> </u>	nibedo	Delistey	•
	•			
PROPER ORBIT	PAT FIFMENTS	· TO A MITT NO MITT	MDEDCUTD	
a e	sin i	FAMILY ME Williams:		
3.096 .1185	5 * .112 6 *	Arnold:		
AU	•			

			54 ALEXAND	RA
	•		·	REFERENCE
B(a,0): 12.15	MAG B(1,0):	NITUDE 8.82 w	t: 2.2	
		COLOR	II D	
B-V α	U-B α	B-V	U-B	
		•		
			<i>,</i>	
	SPECTRAL REFL	ECTIVITY CUR	VE	
В		FACTORS U B-V	U-B	
•				
		•		
	POLA	RIZATION		
$\alpha_{ ext{min}}$	P_{\min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
				,
	I TOUT	CURVE		
Period(hr)	Amplitude	GURVE	Remarks	
7.05 <u>Mi</u>	n. Max. 0.12			Gehrels (1970)
	V•12			dem era (1970)
1	POLE			
Ecliptic Long:	Ecliptic L	at: O	bliquity:	
MASS:	•			. :
Method	PHYSICAL PA	RAMETERS	D !	
rection	Diameter(km)	Albedo	Density	
PROPER ORBITA			EMBERSHIP	
a e	sin i	Williams	:	
2.708 .1868* AU	•2185 [#]	Arnold:		•

			57 INEMOSY	TNE
				REFERENCE
P (a 0)		NITUDE	***	
B(a,0): 12.52	B(1,0):	 	wt: 2.4	·
B-V a	U-B α	COLOR B-V	U-B	
Δ V ω	6 2 a	- ,	÷ -	
				1.
Color = R	SPECTRAL REF	LECTIVITY (CURVE	
	PHASI	E FACTORS		•
В	V		-V U-B	
				•
· · · · · · · · · · · · · · · · · · ·	POL	RIZATION		
$\alpha_{ ext{min}}$	P _{min}	α _x	h (%/deg)	
III III	шсп	X		
	T TOTAL	CIIDIII:		
Period(hr)	Amplitude	CURVE	Remarks	
Mi	n. Max.		•	
	POLI			
Coliptic Long:	Ecliptic I	⊿at:	Obliquity:	
IASS:				
	PHYSICAL PA	RAMETERS		
Method	Diameter(km)	Albe	edo Density	
			•	
PROPER ORBIT			Y MEMBERSHIP	
	sin i * .2668*	Willia		•
3.15° .0766 AU	•4000	Arnolo	1:	

			60 ECHO	
				REFERENCE
R(2 0). 12 60	MAG B(1,0):	NITUDE	t: 2.1	
B(a,0): 12.67	Б(1,0);		L. L.I	
B-V α	U-B α	COLOR B-V	U-B	
		0.84	0.44	Gehrels (1970)
.85 11	.46 11			Ge.&Ow. (1962)
			•	
	SPECTRAL REFL	ECTIVITY CHR	VF.	
			, _	
		FACTORS		
В	, V	U B-V	U-B	
		RIZATION	4-4-4	
$^{lpha_{ t min}}$	P_{\min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
Period(hr)	LIGHT Amplitude	CURVE	Remarks	
Mi	n. Max.			
Long -	0.1			Taylor (1971)
	POLE			
Ecliptic Long:	Ecliptic L	at: 01	oliquity:	·
MASS:				
36 . 1 1	PHYSICAL PA	RAMETERS		
Method	Diameter (km)	Albedo	Density	,
· · · · · · · · · · · · · · · · · · ·				
			•	
משמסתם משפח	AI DIEMENTO	TANTTY	CARDED CLIATE	
PROPER ORBIT	AL ELEMENTS sin i	FAMILY MI Williams	EMBERSHIP :	
2.393 .2009		Arnold:	-	
AU				

	•	•	61 DANAË	
· · · · · · · · · · · · · · · · · · ·				REFERENCE
3(a,0): 12.64	MAGNI B(1,0): 8.		vt: 5.0	
		LOR		
B-V α	U-B a	B-V	U-B	
		0.85	0.43	Gehrels (197
.85 7	.41 7			Wo.& K. (196
C-1 170	SPECTRAL REFLEC	TIVITY CU	RVE	
$Color = \underline{VR}$				
<u> </u>	PHASE F			
B	V U	B-V	U-B	
				•
	POLARI	ZATION		
$\alpha_{ t min}$	$\mathtt{P}_{\mathtt{min}}$	$\alpha_{\mathbf{x}}$	h (%/deg)	
		•		
	LIGHT C	TIDVE		
Period(hr)	Amplitude	OKV L:	Remarks	
Mi				
11.45	0.30	,		Gehrels (1970
•				
	POLE			
cliptic Long:	Ecliptic Lat	: 0	bliquity:	·
ASS:				
10	PHYSICAL PARA			
Method	Diameter (km)	Albedo	Density	
				•
				·
PROPER ORBITA	AL ELEMENTS sin i	FAMILY M	MEMBERSHIP	
2.989 .1308*) ,	
4 • 909 • 1.00	• Je40	Arnold:	•	

			62 ERATO		
`				REFERI	ENCE
B(a,0): 13.96	MA(B(1,0):	GNITUDE	wt: 5.3		
b(a, 0). (3.30	D(1,0).	COLOR	We. 7.7		
B-V α	U-B α	B-V	U-B		
•		0 .7 6	0.40	Gehrels	(1970)
Color = M	SPECTRAL REF	LECTIVITY C	URVE		
		E FACTORS_			
В	V	U B-	V U-B		
	POL	ARIZATION			
$^{lpha_{ t min}}$	$\mathtt{P}_{\mathtt{min}}$	$\alpha_{\mathbf{x}}$	h (%/deg)		
	LIGHT	r curve		, ,	
Period(hr)	Amplitude n. Max.		Remarks		
			· .		
7.1.	POLI		01.11	· · · · · · · · · · · · · · · · · · ·	
Ecliptic Long:	Ecliptic I	_at:	Obliquity:		
MASS:			•		
Method	PHYSICAL PA Diameter (km)	ARAMETERS Albe	do Density		
		•	. •		
PROPER ORBIT	sin i	FAMILY Willia	MEMBERSHIP		
3.134 .1467 AU	* .0224*	Arnold	: 1		

				64 ANGELINA		
,		•			REFER	ENCE
B(a,0): 12.12	B(1,0		wt:	1.8		
B-V α	U-B α	COLOR B-	v	U-B		
Color = BM	SPECTRAL R	EFLECTIVIT	Y CURVE		· · · · · · · · · · · · · · · · · · ·	
В	V	ASE FACTOR U	B-V	U-B		
				·	·	
a _{min}	P _{min}	OLARIZATIO ^a x	•	h (%/deg)		· .
Period(hr)	LI Amplitude in. Max.	GHT CURVE	Re	emarks		
Ecliptic Long:	P Eclipti	OLE c Lat:	Ob1:	lquity:		
MASS:	,					
Method	PHYSICAL Diameter(PARAMETER km) A	S 1bedo	Density		
PROPER ORBIT	s i n i		ILY MEMI liams:	BERSHIP	,	
2.682 .151	.0398*	Arn	old:			

		68 LETO	<u> </u>
			REFERENCE
B(a,0): 11.77	MAGN B(1,0): 8	ITUDE 3.29 wt: 2.2	
B-V α	U-B α	OLOR B-V U-B	
Color = MR Curve = R2B		CTIVITY CURVE R/B = 1. Fairly sharp drop-off into UFACTORS	
В	V U		
^α min	POLAR P _{min}	ax h(%/deg)	
Period(hr)	LIGHT Amplitude in. Max.	CURVE Remarks	
Ecliptic Long:	POLE Ecliptic La	t: Obliquity:	
MASS:			
Method Thermal IR	PHYSICAL PAR Diameter (km) 138-176	AMETERS Albedo Density 0.028-0.047	Matson (1972)
PROPER ORBI	TAL ELEMENTS sin i	FAMILY MEMBERSHIP Williams: Leto	
2.784 0.1 AU	42 0.132	Arnold: A-66	

			69 HESPERI	A
				REFERENCE
3(a,0): 12.13	MA B(1,0):	GNITUDE 8.28	wt: 1.8	
		COLOR		
$B-V$ α	$U-B$ α	B-V	U-B	
			•	
				•
0.1 TH	SPECTRAL REF	TECTIVITY	CURVE	
Color = BM		220117111	001072	
		E FACTORS		
В	V	U B	-V U-B	
•				
	POL	ARIZATION		
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h.(%/deg)	
 	LIGH	T CURVE		<u></u>
Period(hr)	Amplitude		Remarks	
M1	n. Max.			
				·
1.	POL	E		
cliptic Long:	Ecliptic	Lat:	Obliquity:	
ASS:				
	PHYSICAL P	ARAMETERS		· · · · · · · · · · · · · · · · · · ·
Method	Diameter(km	ı) Alb	edo Density	# 8 - 1 - 1
				141
PROPER ORBIT a e			Y MEMBERSHIP	
a e 2.979 .1830	sin i * •1497*	Willi		·
A U • 103 0	• 11121	Arnol	a:	

	•		70 PANOPA	EA
				REFERENCE
B(a,0): 12.28	B(1,0)		wt: 1.8	
B-V α #	U-B α	COLOR B-V	U-B	
Color = BM		EFLECTIVITY C	URVE	
В	V PH	ASE FACTORS U B-	V U-B	
αmin	P _{min}	DLARIZATION α _x	h (%/deg)	
Period(hr) Mi	Amplitude	GHT CURVE	Remarks	
Celiptic Long:	P(Ecliptio	DLE Lat:	Obliquity:	
MASS:				
Method	PHYSICAL Diameter (l	PARAMETERS Albed	do Density	
			·	
PROPER ORBIT a e	sin i	Willia		
2.614 .1620 [*] AU	.1890*	Arnold	: A-72	•

			77 FRIGA	
·				REFERENCE
B(a,0): 12.89	MAG B(1,0):	NITUDE 9.65	wt: 5.2	
B-V α	U-B α	COLOR B-V	U-B	
B-V α	U-B α	P-A	0-B	
·			•	
$Color = \underline{R}$	SPECTRAL REFI	ECTIVITY CU	RVE	
D.		FACTORS	II D	
В	V	U B-V	U-B	
~		RIZATION	h (%/deg)	
α _{min}	P _{min}	$\alpha^{\mathbf{x}}$	II (%) deg)	
•	•			
	:			
Period(hr) A	LIGHT Amplitude	CURVE	Remarks	
M i r	n. Max.			•
Ecliptic Long:	POLE Ecliptic L	at: (Obliquity:	
MASS:		· · · · · · · · · · · · · · · · · · ·		
Method	PHYSICAL PA Diameter (km)	RAMETERS Albed	o Density	
	·			
PROPER ORBITA	L ELEMENTS sin i	FAMILY I	MEMBERSHIP	
2.669 .1116* AU		Arnold:	•	

		_	. 78 DIANA	
				REFERENCE
B(a,0): 12.27		MAGNITUDE): 9.13	wt: 5.7	
B-V a	U-B α	COLOR B-V	U-B	
Color = B	SPECTRAL R	EFLECTIVITY	CURVE	
В	V PH	ASE FACTORS U	B-V U-B	
^α min	P _{min}	OLARIZATION ^Q x	h (%/ deg	g)
Period(hr) Mi	Amplitude	GHT CURVE	Remarks	Taylor (1971)
cliptic Long:	P(Ecliptio	OLE Lat:	Obliquity:	
1ASS:			:	
Method	PHYSICAL Diameter ()	PARAMETERS cm) All	pedo Density	;
DO ODER ON THE	AT THE PROPERTY.			
PROPER ORBITA a e 2.619 .2307*	sin i		LY MEMBERSHIP iams: ld:	

REFER MAGNITUDE B(1,0): 9.28 wt: 2.1 COLOR B-V α U-B α B-V U-B Color = VR Curve = R3A Fairly sharp band 0.95 μ. Possible band 0.67 μ. PHASE FACTORS V U B-V U-B POLARIZATION	. ·
B(a,0): 12.02 B(1,0): 9.28 COLOR B-V α _ U-B α B-V U-B Color = VR / (Color = N/2)	ENCE
B-V α _ U-B α B-V U-B Color = VR	
Curve = R3A Fairly sharp band 0.95 µ. Possible band 0.67 µ. PHASE FACTORS B V U B-V U-B POLARIZATION	
Curve = R3A Fairly sharp band 0.95 m. Possible band 0.67 m. PHASE FACTORS B V U B-V U-B POLARIZATION	
Curve = R3A Fairly sharp band 0.95 m. Possible band 0.67 m. PHASE FACTORS B V U B-V U-B POLARIZATION	
B V U B-V U-B POLARIZATION	
α_{\min} P_{\min} α_{X} $h(\%/\deg)$	
	-
LIGHT CURVE Period(hr) Amplitude Remarks Min. Max.	
POLE cliptic Long: Ecliptic Lat: Obliquity:	
ASS:	
PHYSICAL PARAMETERS Method Diameter(km) Albedo Density	
PROPER ORBITAL ELEMENTS FAMILY MEMBERSHIP a e sin i Williams: Eurynome	
2.444 0.175 0.090 Arnold: B-25	

			80 SAPPHO		<u> </u>
				REFERE	NCE
B(a,0): 11.66	MAGN B(1,0):	NITUDE 9.29 wt	: 2.6		
B-V α '	U-B . α	COLOR B-V	U-B		
	SPECTRAL REFLI	CTIVITY CURV	E		
В	•	FACTORS J B-V	U-B	A transcription for any order of the contraction of	
$\alpha_{ ext{min}}$	POLAI P _{min}	RIZATION CL X	h (%/deg)		·
Period(hr)	LIGHT Amplitude .n. Max.	CURVE	Remarks		
Ecliptic Long:	POLE Ecliptic La	at: Ob	liquity:		
MASS:		•			
Method Thermal IR	PHYSICAL PAR Diameter(km) 84-104	RAMETERS Albedo 0.033-0.04	Density 8	Matson	(1972)
PROPER ORBIT a e 2.297 .1590	sin i	FAMILY MEN Williams: Arnold:	MBERSHIP		
AU		minima.	•		• .

		•	82 ALKMENE	
				REFERENCE
B(a,0): 12.86	B(1,0): 9		t: 4.5	
B-V α	U-B α	COLOR B-V	U-B	
Color = <u>VR</u> Curve = R3A	SPECTRAL REFLE Foor statistics.	0.95 band see	20,5	
В	PHASE V U	FACTORS B-V	U-B	
^α min	POLAR P _{min}	azation ^α x	h (%/deg)	
Period(hr)	LIGHT Amplitude in. Max.	CURVE	Remarks	
				·
Ecliptic Long:	POLE Ecliptic La	t: Ol	oliquity:	
MASS:				
Method	PHYSICAL PAR Diameter(km)		Density	
PROPER ORBIT	TAL ELEMENTS sin i	FAMILY ME Williams:		
2.763 0.24 AU	48 0.048	Arnold:		

		_	85 I	0	
		<u>-</u>		REF	ERENCE
B(a,0): 12.12	В(1,0	MAGNITUDE 0): 8.91	wt: 4.1		
B-V α	U-B α	COLOR B-V	Ŭ-1	3	
			_		
	SPECTRAL R	EFLECTIVITY	CURVE		
В	V PF	ASE FACTORS U E	3-V U-1	3	·
^Q min	P _{min}	OLARIZATION ^O X	h (%,	/deg)	1.
Period(hr)	LI Amplitude In. Max.	GHT CURVE	Remarks		
7.0?	0.17			Yang	(1965)
Ecliptic Long:	P Eclipti	OLE c Lat:	Obliquity		
MASS:	**************************************				
Method	PHYSICAL Diameter(PARAMETERS km) Alb	edo Densi	Lty	
PROPER ORBIT a e 2.654 .1648	sin i	Willi)	
AU . LOGU	• • • • • • • • • • • • • • • • • • • •	Arnol	d: A- 69		•

		•		89 JULIA	
					REFERENCE
3(a,0): 11.18		MAGNITUDE): 8.19	wt:	2.3	
B-V α	U-B α	COLOR B	-V	U-B	
Color = <u>VR</u>	SPECTRAL R	EFLECTIVI'	TY CURVE		
В	V + 0. 035	ASE FACTO	RS B-V + 0.003	U-B + 0.003	Veverka (1970)
α _{min} 9-10°	Pomin	OLARIZATI α, 22	ĸ	h (%/deg) 0•15	Veverka (1970)
Period(hr) M 87	LIO Amplitude in. Max. 0.2	GHT CURVE	Ro	emarks	Taylor (1971)
cliptic Long:	P(Ec lipti c	OLE Lat:	0b1	iquity:	
ASS:					
Method Polarizati	Diameter (1		RS Albedo 10-0.14	Density	Veverka (1970)
a e	TAL ELEMENTS sin i		MILY MEMI lliams:	BERSHIP	
2•553 •14 9 0 AU	.2911*	Arı	nold:		

			,		91 AEGINA		
						REFERENCE	
D (- 0)		M/	AGNITUD		- 0 4		
B(a,0): 12.81		B(1,0)			2.1		
B-V α	U-B	α	COLOR	B-V	U-B		
				·			
Color = BM	SPE	CTRAL RE	FLECTIV	ITY CURVI	£		
0010L - DM							
		PHA	SE FACI			· · · · · · · · · · · · · · · · · · ·	
В	V		U	B-V	U-B		
							-
	-	PO.	LARIZAT		1 (9) (1		
$\alpha_{ t min}$	P_{m}	in		$\alpha_{\mathbf{x}}$	h (%/deg)		
•							
		7 701	rm Grynti	· • ·		<u></u>	
Period(hr)	Amp1i	LIGI tude	IT CURV	E:	Remarks		
101104(111)	Min.	Max.		•	demar no		
					•		
				•			
		POI	E				
Ecliptic Long	:	Ecliptic	Lat:	ОЪ	liquity:		•
MASS:	**************************************			·			
	D	IVCTOAT I	AD A MEM	EDC	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
Method	Di	HYSICAL I ameter (kr	AKAMET n)	Albedo	Density	-	•
					<i>Doi:</i> 0.203		
····		· 					
PROPER OR			F	AMILY MEN	MBERSHIP		
a	e	sin i	W	illiams:			
2.500 AU	1118*	.0385*	A	rnold:			

				92 UNDINA	
		•			REFERENCE
B(a,0): 12.28	MAC B(1,0):		wt: 2.	7	·
B-V α	U-B α	COLOR B-V		U-B	
Color = M	SPECTRAL REFI		CURVE		
В	PHAS! V	FACTORS U B	-V	U-B	
		٠			
	POT.A	RIZATION	····		
$\alpha_{ ext{min}}$	P _{min}	α _x		h (%/deg)	
Period(hr) Am	LIGHT plitude	CURVE	Rema	rks	
Min.	Max.				
Ecliptic Long:	POLE Ecliptic L	Lat:	0bl i qu	ity:	
AASS:					
Method	PHYSICAL PA	RAMETERS Alb	edo n	ensity	
	(IIII)		cuo D	citorcy	
					t .
PROPER ORBITAL	ELEMENTS	FAMIL	Y MEMBER	SHIP	
a e	sin i	Willi.	ams:		

			93 MINERVA	
•				REFERENCE
3(a,0): 12.17	B(1,0): 8		4.8	
B-V α	U-B a	OLOR B-V	U-B	
$\begin{array}{c} \text{Color} = \underline{B} \\ \text{Curve} = \overline{E}1? \end{array}$	SPECTRAL REFLE	CTIVITY CURVE	R/B = 1.15	
В	PHASE I V U	FACTORS B-V	U-B	
α _{min}	POLAR: P _{min}	IZATION ^α χ	h (%/deg)	
Period(hr)	LIGHT (Amplitude Min. Max.	CURVE R	emarks	
cliptic Long:	POLE Ecliptic Lat	оь1	iquity:	
Method	PHYSICAL PARA Diameter (km)	AMETERS Albedo	Density	
PROPER ORB	ITAL ELEMENTS sin i	FAMILY MEM Williams:		
2.754 0. AU	0.156	Arnold: A-		

	•		95 ARETHUSA	
				REFERENCE
B(a,0): 12.90	MAC B(1,0):	SNITUDE 8.89 wt	: 1.8	
		COLOR		
$B-V$ α	$U-B$ α	B-V	U-B	•
			,	
			•	•
Color = BM	SPECTRAL REFI	ECTIVITY CURV	E	
В	V PHASI	FACTORS U B-V	U-B	
D	V	0 D- V	Q-D	•
	POLA	ARIZATION		
$^{lpha_{ exttt{min}}}$	P _{min}	αx	h (%/deg)	,
IIIII	mln	- X		
		·	•	•
	LIGHT	CURVE		
Period(hr)	Amplitude in. Max.		Remarks	
1.1	III. Plax.			
		•		
	POLE			
Ecliptic Long:	Ecliptic I		liquity:	
MASS:		,		
nass.				
Method	PHYSICAL PA Diameter(km)	RAMETERS Albedo	Donaity	
11001100	Diameter (Km)	Albedo	Density	
				···
	TAL ELEMENTS	FAMILY ME	MBERSHIP	
a e	sin i	Williams:		
3.069 .115	9* .2417*	Arnold:		·
AU				

					110 LYDIA	
· .						REFERENCE
B(a,0): 11.94			MAGNITUDE): 8.56	wt:	2.7	
B(a, 0): 11.94	·····	Б(1,0		wc.	~•/	· i · · · · · · · · · · · · · · · · · ·
B-V α	U-1	3 α	COLOR B-	V	U-B	
			0.	71	0.30	Taylor (1971)
	•					
Color = B	SPI	ECTRAL R	EFLECTIVIT	Y CURVE		
	 	PH	ASE FACTOR	8		
В	v	111	U	B-V	U-B	
	+ 0.0	32		+ 0.0016	+ 0.0025	Taylor et al (1971
			OLARIZATIO	N		
$\alpha_{ ext{min}}$	$\mathbf{P}_{\mathbf{n}}$	nin	$\alpha_{\mathbf{x}}$		h (%/deg)	
Dowind (hu)	A 1 4	LIC	GHT CURVE	D -		
Period(hr)	Ampli M i n.	Max.		Re	emarks	
10.92573	0.11	0.20				Taylor (1971)
Ecliptic Long	; :	Po Ecliption	OLE C Lat:	Obli	Lquity:	
MASS:						
Method	i Di	HYSICAL ameter (1	PARAMETER (m) A	S lbedo	Density	
DRODER	D T T M A T	El Clares			<u> </u>	· .
PROPER OF a	e	sin i		ILY MEME liams:	BERSHIP	
2.732 • AU	Of18f1 _#	•0899*		old: A-	86	·

			115 THYRA	
	•	•		REFERENCE
_	_ /1	MAGNITUDE		
B(a,0): 11.70	B(1,0): 9.12	wt: 1.5	
		COLOR	, II D	
B-V α	$U-B$ α	B-V	U-B	
	CDECTRAT D	EFLECTIVITY	CUDVE	
$Color = \underline{R}$	SFECINAL N	ET LECT IVIII	CORVE	
	PH	ASE FACTORS		
В	V		B-V U-B	
			·	

~	P(OLARIZATION	h (%/deg)	
$\alpha_{ ext{min}}$	${\tt P_{min}}$	$\alpha_{\mathbf{x}}$	II (%/ deg)	
			•	
·	LIC	GHT CURVE		
Period(hr)	Amplitude		Remarks	
M	in. Max.			
			₩ 1	
	P(OLE		
Ecliptic Long:	Ecliptio	C Lat:	Obliquity:	
MASS:				·
	DUVCTOAT	DARAMETERO		
Method	PHYSICAL Diameter (1	PARAMETERS km) A1	bedo Density	
	•	,	2	
DDODED ODDI	TAI EIELWIMS	** * * * *		
a e	TAL ELEMENTS sin i	FAMI Will	LY MEMBERSHIP iams:	•
2.379 .1740		Arno		
2.€ 27.9 • 1/4 1	0 .4114	ALIIO	ru:	

		•			116 SIRUNA	
						REFERENCE
B(a,0): 12.22		MAC B(1,0):		wt: 3.	1	
D 17	11 D	_	COLOR B-V		U-B	
B-V a	U-B	α	B-V		U-B	
•						
	SPEC	TRAL REFI	ECTIVITY (CURVE		
В	V	PHASE	FACTORS U B-	-17	U-B	
D	V		О Б	- v	0- B	
	·					•
			RIZATION		1 /9/ / 1	
$\alpha_{ t min}$	$\mathbf{P}_{ ext{mi}}$.n	$\alpha_{\mathbf{x}}$		h (%/deg)	
			•			
		LIGHT	CURVE	-	_	
Period(hr)	Amplit Min.	ude Max.		Rema	ırks	
9.6		≥0.5			٠.	Mc.&Bu. (1972)
7.0		ر ۲۰۰۰				10 adda (1972)
Ecliptic Long	. F	POLE Cliptic L	at.	Obliqu	ity.	
		CIPCIC E				
MASS:						
Method	PH	YSICAL PA meter(km)	RAMETERS Albe	do r	\	
ric ciio d	ĎΙά	meter (Km)	AIDE	ido [ensity	
משפטפס	מיים זרתאו	MENTIC	T3 4 3 CT T T	7 100000		
PROPER OR a	e BILAT FFF	MENTS sin i	FAMILY Willia	MEMBER	SHIP	
2 .7 66	1742*	·0466*	Arnold			
AU	-,	- 		• •		

	•	•	122 GERDA	
				REFERENCE
3(a,0): 13.34	MAG B(1,0):	NITUDE 9.08 wt	7.7	
		COLOR		
B-V α	$U-B$ α	B-V	U-B	•
		0.68	0.41	Gehrels (1970)
Color = B	SPECTRAL REFL	ECTIVITY CURVI	<u> </u>	
	DHASA	ENCHADE		
В		FACTORS U B-V	U-B	
	POLA	RIZATION		
$\alpha_{ ext{min}}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
Dowied (hw)	LIGHT	CURVE) 1	
Period(hr)	Amplitude .n. Max.	r	Remarks	
	POLE	·		
Ecliptic Long:	Ecliptic L	at: 0b1	iquity:	
AASS:		·		
Method	PHYSICAL PA Diameter(km)	RAMETERS Albedo	Density	
PROPER ORBIT		FAMILY MEN	BERSHIP	
a e 3•212 •0981	sin i .0326*	Williams: Arnold:		

124 ALKESTE REFERENCE MAGNITUDE B(a,0): 12.25B(1,0): 9.09wt: 5.1 COLOR B-V U-B U-B B-V α α SPECTRAL REFLECTIVITY CURVE Color = R PHASE FACTORS В V U B-V U-B POLARIZATION h (%/deg) Pmin α_{min} LIGHT CURVE Period(hr) Amplitude Remarks Min. Max. POLE Ecliptic Long: Obliquity: Ecliptic Lat: MASS: PHYSICAL PARAMETERS Method Diameter (km) Albedo Density PROPER ORBITAL ELEMENTS FAMILY MEMBERSHIP sin i Williams: а .0585* ·0560* 2.630 Arnold: AU

				162 LAUR	ENTIA
					REFERENCE
3(a,0): 14.02		MA(B(1,0):		wt: 4.5	
B-V α	U-E	β α	COLOR B-V	U-B	
	SPE	CTRAL REF	ECTIVITY (TIRVE	
				, o. i.	
В	V	PHASI	E FACTORS U B	-V U-B	
			RIZATION		
$\alpha_{ ext{min}}$	$\mathbf{P}_{\mathfrak{m}}$	in	$\alpha^{\mathbf{x}}$	h (%/deg	g)
Pariod (hr)	Λ mm 1 d	LIGHT	CURVE	Remarks	
Period(hr)	Ampli Min.	Max.		Kemarks	
147	-	0.3			Taylor (1971)
Ecliptic Long	3:	POLE Ecliptic I	lat:	Obliquity:	
MASS:		- -			
· · · · · · · · · · · · · · · · · · ·	P	HYSICAL PA	RAMETERS		
Method	d Di	ameter (km)	Albe	edo Density	
PROPER O				MEMBERSHIP	
a 3.026 .2	e :068**	sin i •0973*	Willia Arnolo		
AU	.000	- 0/13	WI HOT	1;	

			179 KLYTA	<u>EMNESTRA</u>
· 				REFERENCE
B(a,0): 13.52	MAC B(1,0):	9.68	wt: 4.4	
B-V α	U-B α	COLOR B-V	U-B	
				·
Color = R	SPECTRAL REFI	LECTIVITY (CURVE	
В	PHASE V	E FACTORS U B	-V U-B	
$\alpha_{ ext{min}}$	PoLA P _{min}	ARIZATION ^α x	h (%/deg)	
Period(hr)	LIGHT Amplitude in. Max.	CURVE	Remarks	
Ecliptic Long:	POLE Ecliptic L	l Lat:	Obliquity:	
MASS:			,	
Method	PHYSICAL PA Diameter(km)	RAMETERS Albe	edo Density	
PROPER ORBIT a e 2.974 .0763	sin i	Willia		
2.974 .0763 AU	•1547	Arnolo	i:	

			182 ELSA	
			·	REFERENCE
B(a,0): 12.72	MAG B(1,0):	NITUDE 10.05 w	t: 5.0	
B-V α	U-B α	COLOR B-V	U-B	
Color = R	SPECTRAL REFL	ECTIVITY CURV	/E	
В		FACTORS U B-V	U-B	
·				
$\alpha_{ ext{min}}$	POLA P _{min}	RIZATION	h (%/deg)	
Period(hr)	LIGHT Amplitude Min. Max.	CURVE	Remarks	
Ecliptic Long:	POLE Ecliptic L		oliquity:	
MASS:	•	•		·
Method	PHYSICAL PA Diameter(km)	RAMETERS Albedo	Density	
			٠.	
a e		FAMILY MI Williams		
2.416 .1' AU	748* .0215*	Arnold:		

٠.	ASTE	ROID DATA SHE	ΣΤ	
			186 CELUTA	
				REFERENCE
B(a,0): 12.92		MAGNITUDE): 10.38	wt: 2.4	
Β-V α	U-B α	COLOR B-V	U-B	
	·			
	SPECTRAL R	EFLECTIVITY CO	JRVE	
В	V V	ASE FACTORS U B-V	/ U-B	
α _{min}	P P _{min}	OLARIZATION α _χ	h (%/deg)	·
Period(hr)	Amplitude Min. Max 20.5	GHT CURVE	Remarks	Mc.&Bu. (1972)
Ecliptic Long	: Eclipti	OLE c Lat:	Obliquity:	
MASS:				
Method	PHYSICAL Diameter(PARAMETERS km) Albeo	do Density	
		·	. •	
	BITAL ELEMENTS e sin i	FAMILY Willian	MEMBERSHIP	
2.362 .1	.2227*	Arnold	:	

							192 NAUSIKAA	
								REFERENCE
B(a,0): 11.04	,		MA(B(1,0):	GNITUD 8.40		wt:	1.9	
Β-V α		U-B	α	COLOR	B-V		U-B	· · · · · · · · · · · · · · · · · · ·
								·
$\begin{array}{c} \text{Color} = \underline{\text{VR}} \\ \text{Curve} = \overline{\text{R3A}} \end{array}$			TRAL REF	sorptio	n band		R/B = 1.66	
В		V	PHAS:	E FACT U	ORS B-V	•	U-B	
					~ 0.00)2		Chapman (1971)
	· · · · · · · · · · · · · · · · · · ·			ARIZAT	ION			
lpha min		Pmin	n	(α _x		h (%/deg)	
Period(hr)	Am	plit		CURV	<u>F.</u>	Re	emarks	
	Min.		Max.					
13.625	-		0.20					Yang (1965)
Ecliptic Long	; ·	Ec	POLI cliptic I	E Lat:		Obli	quity:	
MASS:	·····							
Method	1	PHY Diar	YSICAL PAneter (km)	ARAMETI	ERS Albed	0	Density	<u></u>
							·	
PROPER OF	RBITAL e		MENTS sin i		AMILY illiam		BERSHIP	
2.402 AU	0.206	(0.130	A	nold:	J-2	2	•

				196 PHILOME	LA	
					REFER	ENCE
B(a,0): 11.77	В(1,	MAGNITUDE 0): 7.68	wt:	2.1		·
B-V α	U-B α	COLOR B-V	7	U-B		
	·					
	SPECTRAL	REFLECTIVITY	CURVE			
В	V	HASE FACTORS U	B-V	U-B		
	_	POLARIZATION				
$\alpha_{ t min}$	$P_{ ext{min}}$	$\alpha^{\mathbf{x}}$		h (%/deg)		
Period(hr)	L Amplitude in. Max	IGHT CURVE	R	emarks		
8.333 -	- 0.32				Yang	(1965)
Ecliptic Long:	Eclipt	POLE ic Lat:	Ob1	iquity:	· 	
MASS:					· · · · · · · · · · · · · · · · · · ·	
Method	PHYSICA	L PARAMETERS				·
Method	Diameter	(Km) Al	.bedo	Density		
					· .	
a e	TAL ELEMENTS sin i	Will	LY MEM	BERSHIP		
3•113 • Օևև ՝ AU	7* .1079*	Arno	1d:			

				230 ATHAMAN	TIS	
		:			REFEI	RENCE
3(a,0): 11.20	B(1,0		wt:	1.9		
B-V α	U-B α	COLOR B-V		U-B		
	SPECTRAL R	EFLECTIVITY	CURVE			·
		A SIR TRACHVARS			·	
В	V	U 1	B-V	U-B		
$\alpha_{ ext{min}}$	P _{min}	OLARIZATION α _x		h (%/deg)		
Period(hr)	LI Amplitude Min. Max.	GHT CURVE	Rei	marks		
7 . 996	- 0.10				Yang	(1965)
Ccliptic Long	Po Ecliption	OLE c Lat:	Oblic	quity:		
ASS:						
Method	PHYSICAL Diameter (PARAMETERS km) All	bedo	Density		
	BITAL ELEMENTS		LY MEMBI	ERSHIP	 	
	sin i 339* .1774*	Will: Arno				· :

	•		258 TYCHE	
		,		REFERENCE
B(a,0): 12.68	B(1,0): 9		: 3.4	
B-V α	U-B α	OLOR B-V	U-B	
Color = R	SPECTRAL REFLE	CTIVITY CURV	E	
В	V PHASE U	FACTORS B-V	U-B	
		·		
$\alpha_{ ext{min}}$	POLAR P _{min}	IZATION $\alpha_{\mathbf{x}}$	h (%/deg)	
				·
Period(hr)	LIGHT (Amplitude in. Max.	CURVE I	Remarks	
	POLE			
Ecliptic Long:	Ecliptic Lat	t: Obl	liquity:	
MASS:	PHYSICAL PARA	Λ METED C		
Method	Diameter (km)	Albedo	Density	
·			,	
PROPER ORBIT	sin i	FAMILY MEN Williams:	BERSHIP	
2.61 <i>h</i> . 1806 AU	* . 2538*	Arnold: A	- 70	

		·	268 ADO	REA
·				REFERENCE
(- 0)		GNITUDE	-	
3(a,0): 13.61	B(1,0):		wt: 6.1	·
	** D	COLOR	II D	
B-V α	$\mathbf{U}_{\mathbf{r}}\mathbf{B}$ α	B-V	U-B	, ,
		0.69	0.29	Gehrels (1970)
$Color = \underline{B}$	SPECTRAL REF	LECTIVITY (CURVE	
OOTOL D				
		E FACTORS		
В	V	U B	-V U-B	
	· .			·
	POL	ARIZATION		
$\alpha_{ exttt{min}}$	P _{min}	$\alpha_{\dot{\mathbf{x}}}$	h (%/deg))
	men			
•		'		
Period(hr)	Amplitude LIGH	T CURVE	Remarks	
M	in. Max.			
•	POL	7		
cliptic Long:	Ecliptic 1		Obliquity:	
ASS:				
Method	PHYSICAL PA Diameter(km	ARAMETERS) Albe	edo Density	
CIIO W	Brameter (Kill)	, AIDE	edo Density	
·				
חח מיים	TAT HIS DISCOURT			
PROPER ORBIT	TAL ELEMENTS sin i	FAMILY Willia	Y MEMBERSHIP	
3 . 095 .172 5			•	
2095 •1(2)	• 0611	Arnolo	1: 1	

								321 FLOREN	TINA	
									REFEREN	ICE
3(a,0):	15.06			B(1,0)	AGNITU : 11.3		wt:	6.4		
					COLO			II D		
B-V	α		U-B	α		B-V		U-B		/+000
. 82	10		.45	10		0.81		0.44	Gehrels vanHout.	
Color	= <u>MR</u>		SPEC	ral rei	FLECTI	VITY C	URVE		· · · · · · · · · · · · · · · · · · ·	
В	<u></u>		7.7	PHAS	SE FAC			U-B		****
В			V		U	В-	V	U-D		
		······································	ъ		LARIZA			1. (9/ / 1		
α_{m}	in		Pmin	a ·		$\alpha^{\mathbf{x}}$		h (%/deg)		
	·····									w
Period((hr)	Am Min.	plit	LIGI ude Max.	HT CUR	VE:	Re	emarks		
2.870		- FILIT.		0.38		,			Gehrels	(1970)
Ecliptic	Long	•	F.	POI cliptic	LE Lat·		Obli	.quity:	i	· · · · · · · · · · · · · · · · · · ·
ASS:										·
	lethod		PH	YSICAL I	PARAME				· · · · · · · · · · · · · · · · · · ·	**
	ernoa		Dia	meter (kr	n)	Albe	do	Density		
	ER OR							BERSHIP	,	
a 2.º8		e 2478*		sin i .0379*		Willia ^~~~!~				•
∠.oc AU		M(0	•	7 7		Arnold	: 3			

						. "			324 BAMBERGA		
						*				REFERE	NCE
	0)					GNIT			1		
В (а,	,0):	11.4	1		B(1,0):			wt:	4.5		
						COL			II D		
J	B-V	α		U-B	α		B-V		U-B		
					•						
											:
	Color				TRAL REI				R/B = 1.30	•	
	Curve	= M2		Quite	deep, na			б д.			
	В			7.7	PHAS		CTORS	-V	U-B		
	В			V .		U	Б	- v	U-B		
										•	
,											
					חחם	ΑΡΤ7	ATION				·
	٠ ٣			р.		JAN LA			h (%/deg)		
	$\alpha_{\mathbf{m}}$	in		P _{mi}	n		$\alpha_{\mathbf{x}}$		11 (10) 408)		
				•					•		
					LIGH	IT CU	RVE:				·
Per	ciod(hr)	An	nplit	ude			Re	marks		
			Min.	•	Max.						
8	37		-		0.07					Gehrels	(1970)
							•				
			 		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·				
701i	iptic	Tone	~ •	F	POI cliptic			Ob1i	quity:		
JC I I	rpere	LOII	5 •		CIIPCIC	μαι.		ODII	quity.		
MASS	S:				•					,	
				PH	YSICAL E	ARAM	ETERS				
		etho		Dia	meter (kn	n)	Albe	edo	Density		
	T	herma:	1 IR	250-	310		0.012	-0.016		Matson	(1972)
									·		
	ים	יים מידו	D T C * -	T	\C\!~~	·					
	PROP	EK O	RBITAL e		MENTS sin i				ERSHIP		
		_					Willia		·	*	
	2.68 A U	2	0.288		0.229		Arnol	i:			

			337 DEVOSA	
				REFERENCE
B(a,0): 12.64	MA B(1,0):		wt: 2.8	
B-V α	U-B α	COLOR B-V	U-B	
Color = M Curve = M4	SPECTRAL REF		URVE $R/B = 1.42$	
В	V PHAS	E FACTORS U B-	V U-B	
	POT	ARIZATION		
$\alpha_{ ext{min}}$	P _{min}	α _X	h (%/deg)	
Period(hr)	LIGH Amplitude in. Max.	T CURVE	Remarks	
Celiptic Long:	POL Ecliptic	E Lat:	Obliquity:	
Method	PHYSICAL P Diameter (km	ARAMETERS) Albe	do Density	
PROPER ORBIT	FAL ELEMENTS sin i		MEMBERSHIP ms: Triplet	
2.383 0.1 AU		Arnold		

								341 CALIF	ORNIA	
<u>. </u>									REFERENCE	
2 (2 (1)					GNITUD	E	T.7 = -			
B(a,0):	14.75			B(1,0):		·	WL:	4.8	<u></u>	
B-V	α		U-B	α	COLOR	B-V		U-B		
						0.92		~	Gehrels (19	70)
	1970		ਵੇਸ਼ਾਨਾ	ral ref	<u>ተ</u> ሞተና/	<u>ቸጥ</u> ው <i>ጉ</i>	नएवा			
Color	$= \underline{VR}$		or EC.		TECTIA	111 0	OKVE			
				PHAS	E FACT	ORS				
В			V		U	B-'	V	U-B		
									•	
~~~					ARIZAT	ION				
$\alpha_{\mathbf{r}}$	min		Pmir	n		$\alpha_{\mathbf{x}}$		h (%/deg)		
					•					
Period	(hr)	Am	plit	LIGH ude	T CURV	E:	Re	emarks		
	` '	Min.		Max.						
- 1.				POL	E					
Ecliptio	c Long	:	E	cliptic	Lat:		Ob1:	iquity:		
MASS:									<i>i</i> -	
	Method		PHY	SICAL P	ARAMET	ERS	1			
· 1	rie c i i o d		Diai	meter(km)	Albe	ao	Density		
•										
PROF	PER OR	BITAL	ELEN	MENTS	F	AMTT.Y	MEMI	BERSHIP		
а		e	5	sin i		illia		74321W # # # #		
2.1 AU		η¹5 1 *	,	.0887*	A	rnold	: 7			

	·	·	345 TERCID	INA
;				REFERENCE
B(a,0): 12.57	B(1,		wt: 5.1	
B-V α	U-B α	COLOR B-V	U-B	
Color = EM		REFLECTIVITY	CURVE	
В	V V	U B	-V U-B	
α _{min}	P _{min}	POLARIZATION $\alpha_{\mathbf{x}}$	h (%/deg)	
Period(hr)	L Amplitude in. Max	IGHT CURVE	Remarks	
8.6	~0.4			Mc.&Bu. (1972)
Ecliptic Long:	Eclipt	POLE ic Lat:	Obliquity:	
MASS:				
Method	PHYSICA Diameter	L PARAMETERS (km) Albo	edo Density	
PROPER ORBI	TAL ELEMENTS	FAMTI	Y MEMBERSHIP	
a e 2.352 .0773	sin i	Willi Arnol	ams:	

				349 DEMBOWSI	CA
•					REFERENCE
- (ITUDE		,
B(a,0): 11.04			<u> </u>	: 4.7	
B-V α	U-B		OLOR B-V	U-B	
B-V α	. О-В	α			
			0.96	0.55	Gehrels (1970)
Color = VR	SPECT	RAL REFLE	CTIVITY CURV	E	
00101 - 110					
		•	FACTORS		
В	V	· U	B-V	U-B	
				•	
					·
		POLAR	IZATION		
$\alpha_{ t min}$	P_{\min}		$\alpha_{\mathbf{x}}$	h (%/deg)	
			A		
Period(hr)	Amplitu	LIGHT (de	CURVE 1	Remarks	•
	Min.	Max.	•		
4.701	0.3	0.4			Taylor (1971)
					• • • • • • • • • • • • • • • • • • • •
÷		DOL II			
Ecliptic Long	: Ec	POLE liptic Lat	t: Ob	liquity:	
			,		
MASS:	····				
Method	PHY	SICAL PARA eter(km)	AMETERS Albedo	Donaity	
The circu	Dram	ccer (km)	Aibedo	Density	
					•
	BITAL ELEM e s:	ENTS in i	FAMILY MEI	MBERSHIP	
		360*	Williams:		
AU.	• DC(()	J00	Arnold:	•	

			354 ELEON	ORA
				REFERENCE
- (0)		AGNITUDE		
B(a,0): 11.06	B(1,0)	· 7.56	wt: 3.8	
		COLOR		
B-V α	$U-B$ α	B-V	U-B	
•		0.93	0.54	Gehrels (1970)
• 94 1.8	• <i>5</i> 8 18			Gr.& K. (1954)
.95 17	• <i>5</i> 8 17			Gr.& K. (1954)
•95 16	•58 16			Gr.& K. (1954)
Color = VR	SPECTRAL RE	FLECTIVITY	CURVE	
00101 = <u>yit</u>	•			
_		SE FACTORS		
В	V	U B	-V U-B	
			•	
· · · · · · · · · · · · · · · · · · ·		Y		
•		LARIZATION	h (%/deg)	
$\alpha_{ t min}$	$P_{ exttt{min}}$	$\alpha_{\mathbf{x}}$	II (%) deg)	
			•	
· · · · · · · · · · · · · · · · · · ·	T TO	um cupus		····
Period(hr)	Amplitude	HT CURVE	Remarks	
()	Min. Max.		1,0	
4.277	0.14 0.30		,	Gehrels (1970)
. ,			•	doin 6.23 (1970)
1	PO			
Ecliptic Long:	Ecliptic	Lat:	Obliquity:	
MASS:				•
	PHYSTCAT.	PARAMETERS		
Method	Diameter (k	m) Albe	edo Density	
			•	
DDODED ONE	TMAT DY ENGINE			
PROPER ORB	ITAL ELEMENTS		Y MEMBERSHIP	
_	-	Willia		
2•795 •11	.3028*	Arnolo	d:	

AU

			356 LIGURIA	
				REFERENCE
		NITUDE		
B(a,0): 12.54	B(1,0):	9.11 wt	3.2	
		COLOR		
B-V α	$U-B$ α	B-V	U-B	
	•			
	SPECTRAL REFL	FCTTVTTY CHRV	/E n/n + n/	
$\begin{array}{ccc} \texttt{Color} &= \underline{\texttt{M}} \\ \texttt{Curve} &= \overline{\texttt{M}} \end{array}$	DIBORNE REFE	ECTIVITI CORV	R/B = 1.39	9
	PHASE	FACTORS		
В	V	U B-V	U-B	
•				
	POLA	RIZATION		
$\alpha_{ t min}$	P _{min}	α _x	h (%/deg)	
HITII	шти	X		
Period(hr)	LIGHT Amplitude	CURVE	Remarks	
M	in. Max.		Itemat its	
				·
Ecliptic Long:	POLE Ecliptic L	at: Ob	liquity:	
MASS:				
Method	PHYSICAL PA Diameter(km)	RAMETERS Albedo	Donaitus	
nethod	Drameter (Kill)	Albedo	Density	•
		•		
DD OFFE OF				
PROPER ORBI a e	TAL ELEMENTS sin i	FAMILY ME Williams:		
2.758 0.2				
2.170 0.2	24 0.168	Arnold:		

				364 ISARA		
					REFER	ENCE
T(n ()	D / 1	MAGNITUDE		2.0		
B(a,0): 13.26	В(т	,0): 11.09	wt:	3.9		
7D	T) D	COLOR	7	, 11 D		
B-V a	U-B α	B-7	/	U-B		
		•		•		
						•
	·					
	SPECTRAL	REFLECTIVITY	CURVE			
В	V	PHASE FACTORS U	B-V	U-B		
D	V	U	D-V	0-B	•	
		POLARIZATION	J			
α	Р.			h (%/deg)		
amin	$P_{ exttt{min}}$	$\alpha_{\mathbf{x}}$		1. (10) == 6)		
						•
		LIGHT CURVE				
Period(hr)	Amplitude		Re	emarks		
•	Max Max					
9.155	0.5	0			Yang	(1965)
		DOI E				
Ecliptic Long:	Eclipa	POLE tic Lat:	Obli	lquity:		
		·		1 3 -		~
MASS:			·			
	PHYSICA	L PARAMETERS				
Method	Diameter	c(km) Al	.bedo	Density		
	•				•	
PROPER OPRI	TAL ELEMENTS	T A MT	LY MEME	PEDCUTD	· · · · · · · · · · · · · · · · · · ·	
a e	sin i		.Li Meme .iams:	DEVOUTE		
2.220 .15		5	1d: 8			
· AU		ALIIC	Ta. 0			

•			372 PALMA	
		-		REFERENCE
B(a,0): 12.70	MA B(1,0):	GNITUDE	wt: 3.0	
D(a, o). 12.70	B(1,0).		wc. J.0	
B-V α	U-B α	COLOR B-V	U-B	
			•	
Color = BM	SPECTRAL REF	LECTIVITY CU	JRVE	
	DUAC	E FACTORS		
В	V	U B-V	U-B	
,				
	•			
		ARIZATION		
$\alpha_{ t min}$	$\mathtt{P}_{\mathtt{min}}$	$\alpha_{\mathbf{x}}$	h (%/deg)	
Period(hr)	Amplitude	T CURVE	Remarks	
Mi	n. Max.			
Ecliptic Long:	POL Ecliptic	E Lat:	Obliquity:	
MASS:				
	PHYSICAL P	ARAMETERS		
Method	Diameter (km) Albec	lo Density	
	•			
PROPER ORBIT	AL ELEMENTS	FAMILY	MEMBERSHIP	
a e	sin i	Willian		
3.160 .2 42 0	o* .417 o*	Arnold:	$\mathcal{L}_{i,j}^{(i)}$	

			380 FIDUCI	A
				REFERENCE
B(a,0): 13.87	MAGN B(1,0): 1	ITUDE 0,61 wt:	: 5.9	
·		OLOR		
B-V α	U-B a	B-V	U – B	
		0.72	-	Gehrels (1970
Color = B	SPECTRAL REFLE	CTIVITY CURVE		
		FACTORS		
В	V U	B – V	U-B	
		IZATION	1 (0) (1)	<u> </u>
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
•				
Period(hr)	LIGHT Amplitude	CURVE	Remarks	
N	Max.	•	· ·	
				,
	POLE			
Ecliptic Long:	Ecliptic La	t: Ob1	iquity:	·
MASS:				
	PHYSICAL PARA	AMETERS		
Method	Diameter (km)	Albedo	Density	
DDODED ODD	TOAT DIEMENTO	TIANGET TO A	man auto	· · · · · · · · · · · · · · · · · · ·
a e	TAL ELEMENTS sin i	FAMILY MEN Williams:	IREKZHIL	·
2.679 .082		Arnold: A	-87	
AU		•	•	

385 ILMATAR REFERENCE MAGNITUDE B(1,0): 8.90B(a,0): 12.50wt: 3.9 COLOR U-B U-B B-V B-V α α SPECTRAL REFLECTIVITY CURVE Color = R PHASE FACTORS U-B В V B-V U POLARIZATION P_{\min} h (%/deg) α_{\min} $\alpha_{\mathbf{x}}$ LIGHT CURVE Period(hr) Amplitude Remarks Min. Max. POLE Ecliptic Lat: Ecliptic Long: Obliquity: MASS: PHYSICAL PARAMETERS Method Diameter (km) Albedo Density PROPER ORBITAL ELEMENTS FAMILY MEMBERSHIP sin i Williams: .2427* .1618* 2.845 Arnold: AU

				402 CHLOË		
					REFE	RENCE
B(a,0): 12.99	B(1,0			2.1	,	·
B-V α	U-B α	COLOR I	3-V	U-B		
Color = R	SPECTRAL R	EFLECTIVI	TY CURVE	•		
		ASE FACTO				
В	V	U	B-V	U-B		
	P	OLARIZAT)	ON	<u> </u>		· · · · · · · · · · · · · · · · · · ·
$\alpha_{ t min}$	$\mathtt{P}_{\mathtt{min}}$	c	x	h (%/deg)		
Period(hr)	LIO Amplitude Ln. Max.	GHT CURVE	R	emarks		
				· ·	•	
Ecliptic Long:	Po Ecliption	OLE c Lat:	0Ъ1	iquity:		
MASS:						
Method	PHYSICAL Diameter (PARAMETE km)	RS Albedo	Density		<u>,</u>
·						
PROPER ORBIT	sin i		MILY MEM	BERSHIP		
2.556 .1454 AU	* .1922*	Ar	nold:			

					409 ASPASIA	
	·					REFERENCE
2 (0, 0)	62		AGNITUDE	T.24	J. O	
3(a,0): 11.	57	B(1,0)		wt:	4.0	
B-V α		U-B α	COLOR B-V		U-B	
Color = M Curve = M	-	SPECTRAL REI Possible band	0.57 д.	URVE	R/B = 1.26	
В		V PHĄ:	SE FACTORS U B-	v	U-B	
		PO	ADTZATION			
$lpha_{ t min}$		P _{min}	LARIZATION α _x		h (%/deg)	
		IIITI	X			
Period(hr)) Am Min.	LIGI plitude Max.	HT CURVE	Re	marks	
		POI	Æ			
Coliptic Lo	ong:	Ecliptic	Lat:	Obli	quity:	
ASS:	•					
Meth	nod	PHYSICAL I Diameter (kr	PARAMETERS n) Albe	do	Density	a a com e con e
PROPER a	ORBITAL e	ELEMENTS sin i	FAMILY Willia		ERSHIP Sophrosyne	
2.575 AU	0.094	0.212	Arnold	:		

			REFERENCE
			REFERENCE
	NITUDE	. 0.4	
		4. 1	
		U-B	
	0.86	0.46	Taylor (1971) Gr.& K.(1954)
• 50 / 57			G1 • & M• (17)47
SPECTRAL REFLE	CTIVITY CURVE		
		** **	
V	J B-V	U-B	
			•
POLAR	RIZATION		
P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
т тент	CHRVE		
mplitude	R	Remarks	
1.5			Gehrels (1970)
POLE 7 Ecliptic La	ıt: 28? Obl	iquity: 72?	Vesely (1971)
PHYSICAL PAR	AMETERS		
Diameter(km)	Albedo	Density	•
		BERSHIP	
O LIL L	MTTTTUMS:	•	
	B(1,0):	COLOR U-B \(\alpha \) B-V 0.86 0.56 57 SPECTRAL REFLECTIVITY CURVE PHASE FACTORS V U B-V POLARIZATION Pmin \(\alpha_x \) LIGHT CURVE mplitude F Max. 1.5 POLE T Ecliptic Lat: 28? Obl PHYSICAL PARAMETERS Diameter (km) Albedo	COLOR U-B \(\alpha \) B-V U-B \(0.86 \) 0.46 .56 57 SPECTRAL REFLECTIVITY CURVE PHASE FACTORS V U B-V U-B POLARIZATION Pmin \(\alpha_x \) h (%/deg) LIGHT CURVE mplitude . Max. 1.5 POLE The color of the c

			421 LUITENII	LA.
•				REFERENCE
B(a,0): 12.26	MAGNI B(1,0): 8.	.26 wt:	1.9	
B-V α	U-B α	DLOR B-V	U-B	·
	SPECTRAL REFLEC	CTIVITY CURVE	·	
В	PHASE E V U	ACTORS B-V	U-B	
lpha min	POLARI P _{min}	ZATION α _x	h (%/deg)	
Period(hr) Am Min.	LIGHT (plitude Max. 0.10		emarks	Taylor (1971)
Ecliptic Long:	POLE Ecliptic Lat	Ob1	iquity:	
MASS:	Zerzpere Bae		rqurey.	
Method	PHYSICAL PARA Diameter (km)	METERS Albedo	Density	
PROPER ORBITAL a e 3.061 .0680*	ELEMENTS sin i .2419*	FAMILY MEM Williams: Arnold:	BERSHIP	

		·	478 TERGESTE	
	· · · · · · · · · · · · · · · · · · ·			REFERENCE
B(a,0): 12.81	B(1,0)		:: 2.7	
B-V α	U-B α	COLOR B-V	U-B	
Color = M	SPECTRAL REI	FLECTIVITY CURV	/E	
В	•	U B-V	U-B	
$\alpha_{ ext{min}}$	Pol P _{min}	ARIZATION	h (%/deg)	
·				
Period(hr)	LIGH Amplitude Max.	HT CURVE	Remarks	
Ecliptic Long:	POI Ecliptic		liquity:	
MASS:			· · · · · · · · · · · · · · · · · · ·	·
Method	PHYSICAL I Diameter (kr	PARAMETERS n) Albedo	Density	
PROPER ORBI	TAL ELEMENTS sin i	FAMILY ME Williams:		
3.013 .1016	6 [*] •2432 [*]	Arnold:		

	•			481 EMITA		
	·				REFEREN	CE
B(a,0): 13.24	B(1,0)	AGNITUDE : 9.84	wt: 3	•6	· .	1.
Β-V α	U-B α	COLOR B-V		U-B		
Color = R	SPECTRAL RE	FLECTIVITY	CURVE	<u>-</u>		
В	V PHA	SE FACTORS U B	V	U-B		
^α min	Po P _{min}	LARIZATION ^{O.} X		h (%/deg)		· · · · · · · · · · · · · · · · · · ·
Period(hr)	LIG Amplitude .n. Max.	HT CURVE	Rem	narks		
Ecliptic Long:	PO: Ecliptic	E Lat:	Obliq	uity:		
MASS:						
Method	PHYSICAL Diameter (kı	PARAMETERS n) Alb	edo	Density	e de la companya de	
PROPER ORBIT a e	CAL ELEMENTS sin i	FAMIL Willi	Y MEMBE ams:	RSHIP		
2.743 .1357* AU	.1546*	Arnol	d: A-8 5			

		· · · · · · · · · · · · · · · · · · ·	485 GENUA	
				REFERENCE
B(a,0): 13.07	B(1,0):		2.9	
Β-V α	U-B α	COLOR B-V	U-B	
Color = M	SPECTRAL REFL	ECTIVITY CURV	E	
	PHASE	FACTORS		
В		U B-V	U-B	·
^α min	POLA P _{min}	RIZATION	h (%/deg)	
		OUNT		· · · · · · · · · · · · · · · · · · ·
Period(hr)	Amplitude n. Max.	CURVE	Remarks	
Ecliptic Long:	POLE Ecliptic L	at: Ob	liquity:	
MASS:				
Method	PHYSICAL PA Diameter(km)	RAMETERS Albedo	Density	
PROPER ORBIT	sin i	FAMILY ME Williams:		
2.748 .200.** AU	.2423*	Arnold:		•

			498 TOKIO	
				REFERENCE
B(a,0): 13.20	M/ B(1,0)	AGNITUDE	wt: 4.6	
5(a, 0): 13.20	B(1,0)		WL: 4.0	
B-V a	U-B α	COLOR B-V	U-B	·
	•	0.77	0.36	Gehrels (1970)
:				
	•			
Color = M	SPECTRAL REP	FLECTIVITY	CURVE	
	PHAS	SE FACTORS		
В	V	U B	-V U-B	
•				• • •
	¢			
· · · · · · · · · · · · · · · · · · ·	POI	ARIZATION		
$\alpha_{ exttt{min}}$	Pmin	α _X	h (%/deg)	
IIIII	mln	X	(· · · · · · · · · · · · · · · · · · ·	
	`			·
Period(hr)	LIGH Amplitude	IT CURVE	Remarks	
Mi	in. Max.		Remarks	
				,
•				
	·			
Coliptic Long:	POI Ecliptic		Obliquity:	
			obitquity.	
1ASS:				
Method	PHYSICAL F Diameter (kn	PARAMETERS a) Albe	odo Donaita	
nechod	Diameter (Ki	i) AID	edo Density	
		·		•
	•			
PROPER ORBIT	AL ELEMENTS	FAMTI.	Y MEMBERSHIP	
a e	sin i	Willi		
2.650 .1846	* .1476*	Arnol	d:	
AU				

B(1, υ-B α	MAGNITUDE 0): 11.04 COLOR	Wt	: 6.9	REFEREN	ICE
	0): 11.04	wt	• 6.9		
		wt	• 6.9		
U-B α	COLOR		• 3•/		
U-B α					
	. I	3-V	U-B		
	(0.73	0.25	Gehrels	(1970)
	,				
•					
SPECTRAL	REFLECTIVI	TY CURV	E	 	
			•		
P.	HASE FACTO)RS			
. V	U	B-V	U-B		
	•				
			,		
	POLARIZAT	ON			
${\tt P_{min}}$	· c	$^{\chi}$ x	h (%/deg)		
	,				
L	IGHT CURVE	<u>.</u>	D		
			Remarks		
·	•				*
			•		
	P∩T F	 			
Eclipt	ic Lat:	0b	liquity:		
					·
PHYSICA	L PARAMETE	RS			7
Diameter	(km)	Albedo	Density		
•					
	•				
D. D.					
		MILY ME	MBERSHIP		
	Pmin Pmin Luplitude Max Eclipt PHYSICA Diameter	PHASE FACTO V POLARIZAT: Pmin LIGHT CURVE mplitude Max. POLE Ecliptic Lat: PHYSICAL PARAMETE Diameter (km)	PHASE FACTORS V U B-V POLARIZATION Pmin	PHASE FACTORS V U B-V U-B POLARIZATION Pmin	PHASE FACTORS V U B-V U-B POLARIZATION Pmin Cx LIGHT CURVE mplitude Max. POLE Ecliptic Lat: Obliquity: PHYSICAL PARAMETERS Diameter (km) Albedo Density ELEMENTS FAMILY MEMBERSHIP

IIT RESEARCH INSTITUTE

Arnold: A-72

2.609 AU

			511 DAVIDA	
			<u> </u>	REFERENCE
4		MAGNITUDE	/ -	
B(a,0): 11.35	B(1,0)): 7.13	wt: 6.5	
		COLOR		·
B-V α	$U-B$ α	B-V	U-B	,
		0.71	0.3 6	Gehrels (1970)
.71 5 .72 7	• 3 4 5			Gr.& K. (1954)
.72 7 .71 8	•39 8			Gr.& K. (19 <i>5</i> 4) Ge.&Ow. (1962)
• 7 2	•) /	•		(1/02)
Color = B	SPECTRAL RI	EFLECTIVITY (URVE	
			i.	
		ASE FACTORS		
В	V	U B-	-V U-B	
	•			
	•			
		· · · · · · · · · · · · · · · · · · ·		
		DLARIZATION	h (%/deg)	
$\alpha_{ exttt{min}}$	P_{\min}	$\alpha_{\mathbf{x}}$	11 (%) deg)	ı
	•		•	
-,	T TO	HT CURVE		· .
Period(hr)	Amplitude	GORVE	Remarks	
	Min. Max.			
5.17	0.06 0.25	,		Gehrels (1970)
	•	i		
D-144 T	J001 m 1+ . •	OLE 34?	53?	
Ecliptic Long	$g: \frac{300}{122}$ Ecliptic	c Lat: 10?	Obliquity: 53?	Vesely (1971)
MASS:	•			
	PHYSICAL	PARAMETERS		
Method	d Diameter (cm) Albe	edo Density	
•				
• •				
· ·		•		

PROPER ORBITAL ELEMENTS FAMILY MEMBERSHIP williams:

3.191 .1645* .2504* Arnold:

	•				532 HERCULINA		:
						REFERE	NCE
B(a,0): 11.44		MA B(1,0):	GNITUDE 7.98	wt:	3.4		· ·
			COLOR				
B-V a	U-B	α	B-V		U-B		
.83 u	• 441	4	0.83		0.44	Gehrels Gr.& K.	
Color = MR	SPEC		LECTIVITY	CURVE	. :		
В	V	PHAS	E FACTORS U	B-V	U-B		
D	V		· ·	Д- V	0-13		
*							
	T)		ARIZATION		1. (9) / 1 \		
$\alpha_{ exttt{min}}$	P _{mi}	.n	$\alpha_{\mathbf{x}}$		h (%/deg)		
		LIGH	T CURVE	:			
Period(hr)	Amplit Min.	ude Max.	•	R	emarks		•
18.813	0.08	0.18				Gehrels	(1970)
		POL					
Ecliptic Long	: E	Ccliptic	Lat:	0Ъ1	iquity:		
MASS:	•						•
Method	PH	YSICAL P	ARAMETERS				
Method	12	ımeter (km	ı) All	bedo	Density		
					·		
							•
PROPER ORI	BITAL ELE	MENTS sin i		LY MEM	BERSHIP		· · · · · · · · · · · · · · · · · · ·
2•773 •21 AU	175*	.2622*	Arno	ld: B-	17		

		· ·	540 ROSAM	INDE
				REFERENCE
B(a,0): 14.38	MAG B(1,0):	NITUDE 12.22	wt: 7.3	
B-V α	U-B α	COLOR B-V	U-B	
	С - Б а	0.90	0.48	Gehrels (1970)
•				
				•
Color = <u>VR</u>	SPECTRAL REFL	ECTIVITY C	URVE	
В	•	FACTORS U B-	V U-B	
ь	V	U D-	V 0-B	
			•	
	POLA	RIZATION		
$\alpha_{ t min}$	$P_{ exttt{min}}$	$\alpha_{\mathbf{x}}$	h (%/deg)	
Period(hr)	Amplitude	CURVE	Remarks	
			•	
Ecliptic Long:	POLE Ecliptic L	at:	Obliquity:	
MASS:				
Method	PHYSICAL PA Diameter (km)	RAMETERS Albe	do Density	
	•			
PROPER ORBITA	sin i	FAMILY Willia	MEMBERSHIP ms:	
2.219 .1379* AU	.1063*	Arnold	: 9	

	•		554 PERAGA	<u> </u>
				REFERENCE
B(a,0): 12.06	MAC B(1,0):	9.49	wt: 4.3	
		COLOR		
B-V α	$U-B$ α	B-V	U-B	. '
	-			
Color = B	SPECTRAL REFI	ECTIVITY	$\frac{\text{CURVE}}{\text{R/B} = 1.27}$	
Curve = 31	Possible shallow		$M = \mathbb{I} \cdot \mathcal{L}_{I}$	
	·	FACTORS		
В	V	U B	-V U-B	
	•			
· · · · · · · · · · · · · · · · · · ·	POLA	RIZATION		
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	•
		A		•
			,	
Period(hr)	Amplitude LIGHT	CURVE	Remarks	•
Mi	ln. Max.	٠		
			•	
			,	•
	DOT T			
Ecliptic Long:	POLE Ecliptic I	.at:	Obliquity:	44 - 15 - 15 - 15 - 15 - 15 - 15 - 15 -
MASS:			· · · · · · · · · · · · · · · · · · ·	·
			,	· · · · · · · · · · · · · · · · · · ·
Method	PHYSICAL PA Diameter(km)	RAMETERS Albe	edo Density	
	J =	1120	being rey	•
				•
	•			
PROPER ORBIT	AI EIEMENTO	T3 A 3.6T T 3	V WEWDEDCUIT	
a e	sin i	Willia	Y MEMBERSHIP ams: Peraga	
2.375 0.1		Arnolo		
AU	.5 0,000			•

			563 SULEIKA		
				REFERE	NCE
3(a,0): 12.90	MAGNIT B(1,0): 9.57		3 5		
	COL		J• J		
B-V a U-B	α	B-V	U-B		
00101 - 131	TRAL REFLECT			· · · · · · · · · · · · · · · · · · ·	· ·
***************************************	PHASE FA			·····	
B V	U	B-V	U-B		
		٠.			·
	POLARIZA	ATION			
α_{\min} P_{\min}	Ĺn	$\alpha_{\mathbf{x}}$	h (%/deg)		
				•	
Period(hr) Amplit	LIGHT CU	RVE	emarks		
Min.	Max.				•
,			•	•	
	-				
	POLE				····
cliptic Long:	Ecliptic Lat:	Ob1:	iquity:		· .
IASS:			·		
PI	HYSICAL PARAM	ETERS			,
Method Dia	ameter (km)	Albedo	Density		
					•
PROPER ORBITAL ELE a e	EMENTS sin i	FAMILY MEMI Williams:			
2.713 0.232	0.160	Arnold: A-	84	,	

•	•	·	624 HERTO	}
				REFERENCE
B(a,0): 15.29		MAGNITUDE): 8.67	wt: 10.8	
B-V α	U-B α	COLOR B-V	U-B	
		0.78	0.24	Gehrels (1970)
	SPECTRAL R	EFLECTIVITY	CURVE	
Color = M	SPECIKAL K	EFLECTIVITI	CORVE	
В	V	U B	-V U-B	
·				
α _{min}	P _{min}	OLARIZATION ^a x	h(%/deg)	
Period(hr)	LI Amplitude Max.	GHT CURVE	Remarks	
6.922 533	0.1 1.1		·	Gehrels (1970)
Ecliptic Long:		OLE c Lat: 10?	Obliquity: 757	Vesely (1971)
MASS:				
Method	PHYSICAL Diameter (PARAMETERS km) Alb	edo Density	
		, in the second of the second		
PROPER ORBI	TAL ELEMENTS sin i	FAMIL Willi	Y MEMBERSHIP ams:	

IIT RESEARCH INSTITUTE

Arnold:

5.121 AU

·			658 ASTERI	A
				REFERENCE
n (n 0) - 4 d 0)		ITUDE		
B(a,0): 15.34	B(1,0): 1		5.1	
D		OLOR		
B-V α	U-B α	B-V	U-B	· '
		0.87	0.36	Gehrels (1970)
•				
·			·	
$Color = \underline{VP}$	SPECTRAL REFLE	CTIVITY CURV	/E	
	·	FACTORS		·.
В	, and the state of	B-V	U-B	•
				•
				·
		IZATION	1- /9/ / 1 \	
α_{\min}	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
				1
Period(hr) A	LIGHT (amplitude	CURVE	Remarks	
Min	Max.	•	Kemar Ks	
				•
			•	•
	POLE			
Ecliptic Long:	Ecliptic Lat	t: Ob	liquity:	E T
MΛ ('C' -			· · · · · · · · · · · · · · · · · · ·	
MASS:				<u>, , , , , , , , , , , , , , , , , , , </u>
Method	PHYSICAL PARA	AMETERS		
riechod	Diameter(km)	Albedo	Density	•
				·
PROPER ORBITA	I FIEMENTS	EAMTIN M	MEDGUED	
a e	sin i	FAMILY ME Williams:		
2.855 .04 51*			*	
а•ΩЭЭ • ОЦЭ⊥ АŬ	.0368 [*]	Arnold: 3)	

		•	674 RACHELE		
				REFERI	ENCE
(2.0). 40.00		NITUDE	4.3		
(a,0): 12.23	B(1,0):		1.3		
B-V α	U-B α	COLOR B-V	U-B		
* .					
Color = R	SPECTRAL REFL				
В		FACTORS U B-V	U-B		,
	POLA	RIZATION	· · · · · · · · · · · · · · · · · · ·		
$\alpha_{ ext{min}}$	P _{min}	α _x	h (%/deg)		· ·
Period(hr) A	Amplitude	CURVE R	emarks		
Ecliptic Long:	POLE Ecliptic L		iquity:		
MASS:					
Method Thermal IR	PHYSICAL PA Diameter (km) 84-142	RAMETERS Albedo 0.038-0.10	Density	Matson	(1972
PROPER ORBITA a e	sin i	FAMILY MEM Williams:	BERSHIP	,	
2.921 .1982* AU	.2195*	Arnold: B	-14		

			675 LUDMILLA	·
				REFERENCE
B(a,0): 12.71	MAGI B(1,0):	NITUDE 9.26 wt	t: 4.1	
B-V α	U-B α	COLOR B-V	U-B	
				,
Color = R	SPECTRAL REFLI	CTIVITY CUR	VE	
В	V T	FACTORS J B-V	U-B	
$\alpha_{ t min}$	POLAI P _{min}	RIZATION	h (%/deg)	
Period(hr)	LIGHT Amplitude in. Max.	CURVE	Remarks	
				· · · · · · · · · · · · · · · · · · ·
Ecliptic Long:	POLE Ecliptic La	at: Ol	oliquity:	
MASS:				2
Method	PHYSICAL PAR Diameter(km)	RAMETERS Albedo	Density	
PROPER ORBIT	TAL ELEMENTS sin i	FAMILY MI Williams		
2.771 .1806 AU	.1888*	Arnold:		

					704 INTERAMNI	A	
						REFER	ENCE
B(a,0) : 11.60		B(1,0)		wt:	1.1		
B-V α	U-B	α .	COLOR	B-V	U-B		
$\begin{array}{c} \text{Color} = \underline{B} \\ \text{Curve} = \overline{P3} \end{array}$		CTRAL RE	0.64 д.		R/B = 1.09		
В .	V	PHA	SE FACT U	B-V 0.02	U-B	Chapma	n (1971)
		ъ	LARIZAT				· .
^α min	P _m		LAKIZA	αx	h (%/deg)		
Period(hr)	Ampli Min.	LIG tude Max.	HT CURV	7E F	Remarks	······································	
?	0.11	0.14	· ·	٠		Yang	(1965)
Celiptic Long	g:	PO Ecliptic	LE Lat:	ОЬ 1	iquity:		
MASS:							
Method	d Di	HYSICAL ameter(k		ERS Albedo	Density		
				·			
a	RBITAL EL e	sin i	V	'AMILY MEN	MBERSHIP Doublet		
3.057 AU	0.09	0.324	· A	rnold:		•	

				<i>₹</i>	
٠.				753 TIFLIS	
	,		:		REFERENCE
B(a,0): 14.36	B(1,0)	AGNITUDE: 11.91	wt:	2.6	
B-V α	U-B α	COLOR B-	v	U-B	
					•
		•			
	SPECTRAL RE	FLECTIVIT	Y CURVE	. ,	
		SE FACTOR			·
В	V	U	B-V	U-B	
		LARIZATIO	N		
^α min	P _{min}	αx		h (%/deg)	
Period(hr) A	mplitude	HT CURVE	R	emarks	
9.84 -	~0.8				Mc.&Bu. (1972)
Ecliptic Long:	PO Ecliptic	LE Lat:	0Ь1	iquity:	
MASS:					
Method	PHYSICAL Diameter (k	PARAMETER m) A	S lbedo	Density	

PROPER ORBITAL ELEMENTS
a e sin i Williams:

2.330 .2189* .1628* Arnold: A-77

			779 NINA	
				REFERENCE
B(a,0): 12.99	MAGN B(1,0): 9	ITUDE •75 wt	: 0.8	
		OLOR		
B-V α	$U-B$ α	B-V	U-B	·
		•		
Color = EM	SPECTRAL REFLE	CTIVITY CURV	E	
	РНДСК	FACTORS		
В	V U	B-V	U-B	
			,	
·	POLAR	IZATION		
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
· ·				·
	LIGHT	CURVE	<u>.</u>	
Period(hr)	Amplitude n. Max.		Remarks	
	POLE			·
Ecliptic Long:	Ecliptic La	t: Ob	liquity:	
MASS:	· · · · · · · · · · · · · · · · · · ·			
	PHYSICAL PAR	AMETERS		
Method	Diameter (km)	Albedo	Density	
,	•			
PROPER ORBIT	AI. ELEMENTS	FAMILY ME	MRFRSHIP	
a e	sin i	Williams:		
2.665 .1910 [*]	.2711*	Arnold:	B-18	•
AII.			•	

			911 AGAME	MON
·				REFERENCE
B(a,0): 15.55		MAGNITUDE): 8.92	wt: 3.2	
B-V α	U-B α	COLOR B-V	U-B	
	7 7;	0.80	- ·	Gehrels (1970)
		·		
Color = M	SPECTRAL R	EFLECTIVITY C	URVE	
В	V PH.	ASE FACTORS U B-	V U-B	
$\alpha_{ t min}$	P _{min}	OLARIZATION ^C x	h (%/deg)	
Period(hr)	LIC Amplitude .n. Max.	GHT CURVE	Remarks	
7? -	0.3			Gehrels (1970)
Ecliptic Long:	P(Ecliption	OLE c Lat:	Obliquity:	
MASS:	· :			
Method	PHYSICAL Diameter (PARAMETERS km) Albe	do Density	
	•	· · · · · · · · · · · · · · · · · · ·		
PROPER ORBIT a e	AL ELEMENTS sin i	FAMILY Willia	MEMBERSHIP ms:	
5•1 <i>5b</i> AU		Arnold	:	

			976 BENJAMINA			
				REFERENCE		
B(a,0): 14.76	MAGN B(1,0): 10	ITUDE 0.55 wt	: 6.9			
		OLOR	77			
B-V α	U-B α	B-V	U-B			
		0.74	0.25	Gehrels (1970)		
•		•				
•						
0.1	SPECTRAL REFLE	CTTVITY CURV	E			
Color = M			_			
		FACTORS		··		
В	V U	B-V	U-B			
•	•					
	POLAR	IZATION				
$\alpha_{ t min}$	P _{min}	$\mathbf{a}_{\mathbf{x}}^{'}$	h (%/deg)	,		
		17				
	•	•				
· · · · · · · · · · · · · · · · · · ·	LIGHT	CUDUE				
Period(hr) A	Amplitude	CURVE	Remarks	. ,		
M i r	n. Max.					
	POLE					
Ecliptic Long:	Ecliptic La	t: Ob	liquity:	·		
MASS:						
	PHYSICAL PAR	A METER C	· .			
Method	Diameter (km)	Albedo	Density			
			· ·			
				•		
PROPER ORBITA	AL ELEMENTS	FAMILY ME	MRERSHIP			
a e	sin i	Williams:	· IIII			
3.183 .1668*	.1506*	Arnold:	•			
AU				• •		

			984 GRETIA	
				REFERENCE
B(a,0): 14.28	M/ B(1,0)	AGNITUDE : 10.76	wt: 5.4	
· · · · · · · · · · · · · · · · · · ·		COLOR		
B-V a	U-B α	B-V	U-B	
				·
· · · · · · · · · · · · · · · · · · ·	SPECTRAL REI	LECTIVITY CU	IRVE	
	РНА!	SE FACTORS		······································
В	V	U B-V	U-B	
	:		•	
·	PO	ARIZATION		
$\alpha_{ ext{min}}$	P _{min}	α _X	h (%/deg)	•
			! !	
			· .	
Period(hr)	Amplitude	IT CURVE	Remarks	
5.76	- 0.4	:		Mc.&Bu. (1972)
		· ·		
Ecliptic Long:	POI Ecliptic	E Lat:	Obliquity:	
MASS:				
Mark 1	PHYSICAL I	PARAMETERS		
Method	Diameter (kr	n) Albed	lo Density	·
•		•	•	
·	•	•		
PROPER ORBIT	AL ELEMENTS sin i	FAMILY William	MEMBERSHIP	
2.804 .1594	.1746*	Arnold:	A-91	

		1043 BEATS	
			REFERENCE
		4.	
B(1,U)		t: 5.8	·
13 D		TT D	
υ-в α			
	0.90	0.45	Gehrels (1970)
ODDOMDAL DE	TT DAMEST THE AND		
SPECTRAL RE	FLECTIVITY CUR	VE	
рил	CE EXTURDS		
		U-B	•
•			
		•	•
			·
PO	LARIZATION		
	·	h (%/deg)	
шти	•		
,			•
•			
LIG	HT CURVE	_	
		Remarks	
ritii. riax.			
•	•		
PO	I.F.		
g: Ecliptic		bliquity:	•
·			
PHYSICAL 1	PARAMETERS	• .	
1 Diameter (Ki	m) Albedo	Density	
	•		
RBITAL ELEMENTS	FAMILY M	EMBERSHIP	
e sin i			
ж ж			
.0380* .1460*	Arnold:	•	
	B(1,0) U-B a SPECTRAL RE PHA V PO Pmin LIG Amplitude Min. Max. PO Ecliptic PHYSICAL Diameter (k)	COLOR U-B \(\alpha \) B-V 0.90 SPECTRAL REFLECTIVITY CUR PHASE FACTORS V U B-V POLARIZATION Pmin \(\alpha_x \) LIGHT CURVE Amplitude Min. Max. S: Ecliptic Lat: O PHYSICAL PARAMETERS Diameter (km) Albedo	COLOR U-B \(\alpha \) B-V U-B 0.90 0.45 SPECTRAL REFLECTIVITY CURVE PHASE FACTORS V U B-V U-B POLARIZATION Pmin \(\alpha_x \) h(%/deg) LIGHT CURVE Amplitude Min. Max. Remarks POLE 3: Ecliptic Lat: Obliquity: PHYSICAL PARAMETERS Diameter (km) Albedo Density RBITAL ELEMENTS FAMILY MEMBERSHIP

		· ·	1287 LORO	CIA
				REFERENCE
P (2 0) . 4 (0)		AGNITUDE	** • • <i>(</i>	
B(a,0): 16.04	B(1,U)		vt: 3.6	
B-V α	U-B α	COLOR B-V	U-B	
		0.85	0.36	Gehrels (1970)
•	•			· .
Color = <u>VR</u>	SPECTRAL RE	FLECTIVITY CUI	RVE	
00101 - 11				
-		SE FACTORS		
В	V .	U B-V	U-B	
				,
				•
	PO	LARIZATION		
$\alpha_{ t min}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
		•		
	LIG	HT CURVE		·
Period(hr)	Amplitude		Remarks	
Mi	n. Max.			
	PO	LE	\1.1.	
cliptic Long:	Ecliptic	Lat: (Obliquity:	
ASS:				
3.61	PHYSICAL	PARAMETERS		
Method	Diameter (k	m) Albedo	Density	
•	e e			
	·			
PROPER ORBIT			TEMBERSHIP	
3.012 .0769	sin i *	Williams		•
3.012 .0769 AU	* .1770*	Arnold:	2	

		·	1291 PHRYN	E
, .				REFERENCE
P (2 0) - 15 29		GNITUDE	. 57	
B(a,0): 15.38	B(1,0):		: 5.7	
B-V α	U-B α	COLOR B-V	U-B	
		0.83	0.39	Gehrels (1970)
			•	
	CDECTOAT DEE	LECTIVITY CURV	·tr	
$Color = \underline{MR}$	SPECIAL REF.	LECTIVITI CURV	E	
	PHAS	E FACTORS		
В	V	U B-V	U-B	
•				
		ARIZATION		
$\alpha_{ exttt{min}}$	P _{min}	$\alpha_{\mathbf{x}}$	h (%/deg)	
	LIGH'	T CURVE		· · · · · · · · · · · · · · · · · · ·
Period(hr)	Amplitude .n. Max.		Remarks	
PIA	Hax.			
	<i>:</i>			
,		<u> </u>		
Ecliptic Long:	POLI Ecliptic 1		liquity:	. •
1ASS:		······································	· · · · · · · · · · · · · · · · · · ·	
Method	PHYSICAL PA Diameter(km	ARAMETERS) Albedo	Density	
	,	, midedo	Delisity	•
				1
PROPER ORBIT	AL ELEMENTS	FAMILY ME	MRERSHIP	
a e	sin i	Williams:		
3.01% .0713	* .1691*	Arnold:	2	
AU	· · · · ·			

		_		1437 DICMEDI	ES
					REFERENCE
B(a,0): 15.87		AGNITUDE 9.23	wt:	6.1	
~ **	`x: D	COLOR		II D	
B-V a	U-B α	B-V	.	U-B 0•20	Gehrels (1970)
		0.72		U,•	denreis (1970)
					·
·	SPECTRAL RE	THE EAST OF THE	CHIDITE		·
$Color = \underline{B}$	SPECIKAL RE	PLTECTIATII	CURVE		
		SE FACTORS	,		
В	V	U 1	B-V	U-B	
		,	*		•
α _{min}	P _{min}	DLARIZATION G		h (%/deg)	
min	min	$\alpha_{\mathbf{x}}$		(,8)	•
					į
	LIG	HT CURVE	·		
Period(hr)	Amplitude n. Max.	•	R	emarks	
•	35 0.42			÷	Taylor (1971)
· · · · · · · · · · · · · · · · · · ·	PC	OLE			
Ecliptic Long:	Ecliptio	Lat:	Obl	iquity:	
MASS:					
Method	PHYSICAL Diameter (k	PARAMETERS m) All	oedo	Density	
					·
•			•		
. ·	· ·				
PROPER ORBIT a e	AL ELEMENTS sin i	FAMII Will		BERSHIP	
5.083		Arno	ld:		

		·		1566 ICARU	s
					REFERENCE
3(a,0): 12.24	B(1,0	MAGNITUDE): 17.62	wt: 2	2.5	
		COLOR			,
$B-V$ α	U-B a	B-V		U-B	•
	· -	0.80		0.66	Gehrels (1970)
				•	•
	SPECTRAL R	EFLECTIVITY	CURVE		
		A COLOR DE A COUNTRIES		· · · · · · · · · · · · · · · · · · ·	
В	V V	ASE FACTORS U	B-V	U-B	
*					
•					
-	D.	OLARIZATION			
$^{lpha_{ t min}}$	P _{min}	OLARIZATION a _X		h (%/deg)	
	IIIII	X			
		·			
	T T	GHT CURVE			
Period(hr)	Amplitude	GHI CURVE	Ren	marks	
	In. Max.				(4000)
2.273 0.	0.22				Gehrels (1970)
				•	•
Celiptic Long:		OLE c Lat: 28?	Oblic	quity: 767	Vesely (1971)
		C Lat. 201	ODIIC	quity. 701	vesery (1971)
1ASS:			·		
Method	PHYSICAL Diameter (l	PARAMETERS	bedo	Density	
333 2320 2	. Drameter (KIII) AII	·	Density	
		. ·		·	
•					
PROPER ORBIT	TAL ELEMENTS	FAMT	LY MEMBI	ERSHIP	
a e ′	sin i	Will	iams:		
1.078 .827 [#]	•374*	Arno	1d:		
A U				•	

			1620 GEOGRA	PHOS
				REFERENCE
		GNITUDE		
B(a,0): 13.38	B(1,0):	15.97 W	t: 1.4	
		COLOR		
B-V a	$U-B$ α	B-V	U-B	
		0.82	• -	Gehrels (1970)
	· · · · · · · · · · · · · · · · · · ·	٠.		•
C-1-m - 1/10	SPECTRAL REF	LECTIVITY CUR	VE	
$Color = \underline{WR}$	01-01101			·
	PHAS	E FACTORS		
. B	V	U B-V	U-B	
	•			
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$\alpha_{ ext{min}}$	P_{\min}	$\alpha_{\mathbf{x}}$	h (%/deg)	•
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	T TOU	r curve		
Period(hr)	Amplitude	I CORVE	Remarks	
• •	Min. Max.			•
5.2230	1.2 2.0			Taylor (1971)
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Ecliptic Long	: 113? Ecliptic I	at: 85? O	bliquity: 187	Vesely (1971)
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No. 1 1	PHYSICAL PA			
Method	Diameter (km)) Albedo	Density	
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